

REVISION OF THE WEEVIL GENUS *LONCOPHORUS* CHEVROLAT (COLEOPTERA: CURCULIONIDAE, ANTHONOMINAE)

Wayne E. Clark

Department of Entomology and

Alabama Agricultural Experiment Station

Auburn University, Alabama 36849

U.S.A.

Quaestiones Entomologicae

24: 465-520 1988

ABSTRACT

The 13 species of Anthonominae assigned to the genus *Loncophorus* Chevrolat are hypothesized to form a monophyletic group on the basis of morphological characters of the adult weevils and host plant relationships. Other adult morphological characters are cited as evidence supporting a hypothesis of phylogenetic relationships among the species. The genus *Loncophorus* is limited in geographical distribution to the Neotropical region and appears to be restricted to hosts in the plant family Bombacaceae. Characters by which members of the genus are distinguished from other Anthonominae and diagnoses and descriptions of each of the species, as well as a key and illustrations, are presented as aids for identification. Four new species, *L. costalimai* (Brazil), *L. crossi* (México), *L. martinsi* (French Guiana, Brazil, Paraguay) and *L. myrmecodes* (Panamá) are described. *Anthonomus santarosae* Clark is newly placed in *Loncophorus* as *L. santarosae* (Clark), new combination. A neotype is designated for *L. daviesii* (Swederus). Lectotypes are designated for *L. obliquus* Chevrolat, *L. humeralis* Chevrolat, *L. petiminosus* Germar, *L. chevrolati* Gyllenhal, *L. fortis* (Champion) and *L. fusiformis* (Champion). The name *Loncophorus marshalli* Costa Lima is placed in new synonymy under *L. obliquus* Chevrolat, and *L. fluminensis* Costa Lima is placed in new synonymy under *L. pustulatus* (Champion). *Loncophorus verruciger* Champion is transferred to *Atractomerus* as *A. verruciger* (Champion), new combination.

RESUMEN

Algunos caracteres morfológicos de los adultos, y relaciones de las plantas hospederas, indican que las 13 especies de Anthonominae asignadas al género *Loncophorus* Chevrolat constituyen un grupo monofilético. Se citan otros rasgos morfológicos de los adultos como evidencia de las relaciones filogenéticas entre las especies. El género *Loncophorus* se encuentra restringido a la Región Neotropical y parece estar limitado a plantas hospederas de la familia Bombacaceae. Se presentan caracteres que distinguen a las especies de *Loncophorus* de otros Anthonominae, caracteres diagnósticos y una descripción de cada especie del género, además de una clave e ilustraciones para auxiliar en la identificación de las especies. Se describen cuatro especies nuevas y se designa un neotipo para *L. daviesii* (Swederus) y lectotipos para otras seis especies previamente descritas (véase el resumen en inglés).

Anthonomus santarosae Clark es transferido a *Loncophorus* (combinación nueva). Se sinonimiza a *Loncophorus marshalli* Costa Lima con *L. obliquus* Chevrolat, y a *L. fluminensis* Costa Lima con *L. pustulatus* (Champion), y *L. verruciger* Champion es transferido a *Atractomerus* (combinación nueva).

INTRODUCTION

Weevils of the genus *Loncophorus* Chevrolat are distributed throughout much of the Neotropical Region from México to Argentina. Adults and larvae of several of the species are known to be associated with plants in the family Bombacaceae. Larvae of some of the species develop in the fruits, while others are known from the flower buds of these plants. The species of *Loncophorus* are of special interest because of their close relationship to certain Anthonominae associated with plants in the Malvaceae, a family closely related to the Bombacaceae (Cronquist 1981). Among these anthonomines are the species of *Anthonomus* assigned to the subgenus *Anthonomorphus* Dietz by Burke (1964) and those, including *A. grandis* Boheman, assigned to the *A. grandis* group by Clark and Burke (1986b) and by Burke *et al.* (1986). The larvae and pupae of the species in these groups have long been known to share several unique characters with each other and with *Loncophorus fusiformis* (Champion) (Ahmad and Burke 1972, Burke 1968, Burke *et al.* 1984, Clark and Burke 1986a). In light of this, discovery that the immature stages of another anthonomine associated with plants in the family Bombacaceae are virtually identical to those of *L. fusiformis* and of the species of *Anthonomorphus* took on special significance.

This anthonomine occurs in Central and South America where it develops in flower buds of *Bombacopsis quinata* (Jacq.) Dugand. The adult and immature stages of the species were described by Clark and Burke (1986a) who assigned it to the genus *Anthonomus* and named it *A. santarosae* Clark. An important conclusion of the present study, however, is that this anthonomine does not belong in the genus *Anthonomus* but is instead a species of *Loncophorus*. It is thus placed in *Loncophorus*, along with 12 other species, four of which are described here for the first time. Three of these four would almost certainly have been assigned as well to *Anthonomus* rather than to *Loncophorus* had their phylogenetic relationships been less well understood. The rationale for the decision to delimit *Loncophorus* in such a way as to include them is presented herein, along with characters by which the genus is distinguished from other anthonomine genera. Descriptions or redescriptions, illustrations, and a key to the species of *Loncophorus* are also presented. The information about these species will be analyzed in future studies aimed at determination of the precise relationships of the species of *Loncophorus* to the species of *Anthonomus* in the subgenus *Anthonomorphus* and in the *A. grandis* species group.

The present study was undertaken as one of several revisions of various groups of Anthonominae (Clark 1987a,b,c, 1988, in press; Clark and Burke 1985, 1986a,c).

In spite of progress in these studies, the classification of the subfamily remains almost as "chaotic" as Burke (1976) reported. It is not based on a hierarchy of natural groups, but has been constructed mostly by the piecemeal isolation of those species or small groups of species with the most striking characters. The result is somewhat like a landscape as seen from the sky with slender mountain peaks visible as they protrude through a shroud of fog. The peaks are distinguished easily enough, but their relationships to one another are not understood because the fog covers what would seem to be a paraphyletic residuum in the intervening valleys. The present study is a very small step toward resolution of the relationships of the 500 or so described species of Anthonominae (ca. 82% of them in the New World) and an estimated like number that remain undescribed.

MATERIAL AND METHODS

Material

Specimens of 577 adults, including the types of most of the previously described species, were examined. These were from the collections of the following individuals and institutions (letter codens identify the collections in the text):

AMNH	The American Museum of Natural History, New York City, New York, USA, L.H. Herman, Jr.;
AUEM	Auburn University Entomological Collections, Auburn, Alabama, USA, W.E. Clark;
BMNH	The British Museum (Natural History), London, England, R.T. Thompson;
CCBM	Collection of C. Bordón, Maracay, Venezuela;
CHAH	Collection of H.A. Hespenheide, Los Angeles, California, USA;
CNCI	Canadian National Collection of Insects and Arachnids, Ottawa, Canada, D.E. Bright;
CWOB	Collection of C.W. O'Brien, Tallahassee, Florida, USA;
DEIC	Deutsches Entomologisches Institut, Eberswalde, DDR, L. Dieckmann;
DZUP	Universidade Federal do Paraná, Curitiba, Brazil, G.H. Rosado-Neto;
FIOC	Fundação Oswaldo Cruz, Rio de Janeiro, Brazil, O.V. Ferreira;
FMNH	Field Museum of Natural History, Chicago, Illinois, USA, J.S. Ashe;
HAHC	Collection of H. and A. Howden, Ottawa, Canada;
IACC	Instituto Agrônomo, Campinas, Brazil, A.L. Lourenção;
IBUS	Universidade Federal Rural de Rio de Janeiro, Seropédica, Brazil, E. Menezes;
IZAV	Universidad Central de Venezuela, Maracay, Venezuela, L.J. Joly;
MNHN	Muséum National d'Histoire Naturelle, Paris, France, H. Perrin;
MLUH	Martin-Luther-Universität, Halle, DDR, M. Dorn;
MZSP	Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil, U.R. Martins;

NHRS	Naturhistoriska Riksmuseet, Stockholm, Sweden, P.I. Persson;
NZAC	Division of Scientific and Industrial Research, Auckland, New Zealand, G. Kuschel;
TAMU	Texas A&M University, College Station, Texas, USA, H.R. Burke;
USNM	National Museum of Natural History, Washington, D.C., USA, D.R. Whitehead;
ZMAS	Zoological Museum, Academy of Sciences, Leningrad, USSR, B. Korotjaiev;
ZMHB	Humboldt-Universität, Berlin, DDR, F. Hieke;
ZMUC	Zoological Museum, University of Copenhagen, Copenhagen, Denmark, O. Martin.

Methods

Measurements were made with an ocular micrometer in a dissecting microscope as follows: total body length from anterior margin of eye to elytral apex in lateral view; width across elytra at widest point; length of pronotum from anterior to posterior margins; length of rostrum from anteroventral margin of eye to apex, across arc, in lateral view; length of distal portion of rostrum from antennal insertion to apex in lateral view; width of frons at narrowest point between eyes; width of base of rostrum just distad of eyes in dorsal view; and width of pro- and metafemora, in anterior view, excluding the ventral teeth. The range and, in parentheses, the mean and sample size of each measurement, are given for each species.

Phylogenetic relationships of the species of *Loncophorus* were analyzed using PAUP, Phylogenetic Analysis Using Parsimony, Version 2.4.1 (Swofford 1985), on an IBM Personal Computer (see Phylogeny section).

GENUS *Loncophorus* Chevrolat

Loncophorus Chevrolat 1832a: 215. Type species, by subsequent designation (Pierce 1916: 467), *Loncophorus obliquus* Chevrolat 1832a: 218. Ahmad and Burke 1972: 43. Blackwelder 1947: 837. Blanchard 1845: 109. Burke 1968: 28; 1976: 286. Costa Lima 1943; 1955; 1956: 146, 147, 149. O'Brien and Wibmer 1982: 112. Pierce 1916: 467–468. Schönherr 1836: 391–392. Wibmer and O'Brien 1986: 202.

Lonchophorus Schönherr 1838: 1123 (not Germar 1824: 106; not Eschscholtz 1825: 734). Type species, by subsequent designation (Pierce 1916: 467), *Loncophorus obliquus* Chevrolat 1832a: 218. Laporte 1840: 343. Lacordaire 1863: 577–578. Champion 1903: 151. Gemminger and Harold 1871: 2498. Heyne and Taschenberg 1908: 230. Schenkling and Marshall 1934: 4. Schönherr 1843: 293. Voss 1944: 40–41.

Delimitation of the genus.— Chevrolat (1832a) included two species in *Loncophorus* when he established the genus, but the above cited workers had proposed an additional 18 names for species in the genus by the time O'Brien and Wibmer (1982) and Wibmer and O'Brien (1986) compiled their checklists of New World Curculionidae. Of these names, 13 were listed as valid in the checklists. This is the same number of species group names recognized as valid herein, but the

names are not all the same. Three of the 13 names recognized in the checklists as valid have turned out to be synonyms, two of the remaining 10 names are valid for species now excluded from the genus, and five species not listed in the checklists are newly assigned to the genus.

The two excluded species, like the eight checklist species retained in *Loncophorus*, are Anthonominae with relatively large adults that were or could have been described by Champion (1903) as “navicular” (boat-shaped) or by Voss (1944) as “keilartig” (wedge-shaped). They are rather distinct from four of the five species assigned to *Loncophorus* for the first time. The four anomalous species are *L. santarosae*, originally described as a member of the genus *Anthonomus*, and three new species, *L. costalimai*, *L. martinsi* and *L. myrmecodes*. The main features that set these four species apart are the relatively small size and non-navicular form of the adults. They are placed in *Loncophorus* under the assumption that the adults have “lost” large size and navicular form and their inclusion must be justified by the kind of reasoning that allows placement of snakes in Tetrapoda and fleas in Pterygota, namely, that certain “attributes which appear different in some way are nonetheless the same (or homologous)” and that the species share characters in their “original or in some modified form” (Platnick 1979).

Other features, in addition to form and size, contribute to the disparity within *Loncophorus*, however. Adults of the most atypical non-navicular species, *L. santarosae* and especially *L. myrmecodes*, are like those of several species of *Anthonomus* in various apparently unrelated groups that resemble Curculionidae of the subfamily Otidoccephalinae (Clark 1988). The relatively narrow prothorax and more or less smooth, black, rounded, shining elytra make adults of these species very different in general appearance from those of the other members of the genus, especially the large, navicular ones. The species with otidocephaline-like adults share apomorphic characters with the other non-navicular species, however, and with some of the species with large, navicular adults. These characters are evidence that the species assigned to the genus, diverse as they are, nevertheless form a monophyletic group (see Phylogeny section).

Recognition.— The species assigned to the genus *Loncophorus* are distinguished from species in other anthonomine genera by the characters listed below (see discussion in the Delimitation of the Genus section).

1) The elytra are widest at or slightly behind the humeri in the species with relatively large, navicular elytra (*L. obliquus*, *L. daviesii*, *L. longinasus*, *L. varius*, *L. fortis*, *L. chevrolati*, *L. pustulatus*, *L. crossi* and *L. fusiformis*) (Figs. 1–16). This form is not shared by the species with non-navicular elytra (*L. costalimai*, *L. martinsi*, *L. santarosae* and *L. myrmecodes*) (Figs. 17–24), nor is it unique to the genus *Loncophorus*.

2) The navicular elytra have a large, somewhat flattened discal or middorsal

area covered by dense, pallid scales and a declivital area with similar scales. These areas are completely or incompletely separated by slightly elevated posterolateral sections with sparse vestiture (Figs. 1–16). They are distinguishable but not well-developed in adults of the non-navicular *L. costalimai* (Figs. 17, 18), less well-developed in *L. martinsi* (Figs. 19, 20) and lost in *L. santarosae* and *L. myrmecodes* (Figs. 21–24).

3) The prothorax has more or less distinct postocular lobes in the species with navicular elytra. This is not shared by the species with non-navicular elytra and is not unique among anthonomines to *Loncophorus*.

4) The mesotrochanters of the species with navicular elytra and *L. costalimai* are subtrapezoidal (Fig. 39). The mesotrochanters in the male of the other species with non-navicular elytra are more nearly trapezoidal and prominent (Fig. 40).

5) The profemoral tooth has an anterior emargination in all of the species. The tooth is slightly irregularly serrate distal to the emargination in most of them (Fig. 37). The serrations appear to be most well-developed in newly emerged specimens and to become worn down with age and may not be visible in some specimens (Fig. 38). They are obsolescent in *L. santarosae* and *L. myrmecodes*.

6) The prosternum is extended downward in front of the procoxae in the navicular *L. obliquus*, *L. daviesii*, *L. longinasus*, *L. varius* and *L. fortis*, but not in the other members of the genus.

7) Elytral interstria 5 has a discal prominence in adults of three of the species with navicular elytra and in all of the species with non-navicular elytra. This prominence is adjacent to and less well-developed than a larger pustule on interstria 4 in *L. pustulatus* and *L. crossi*. It is smaller, but more distinct and pustulate, in *L. fusiformis*, *L. costalimai* and *L. martinsi* which do not have an adjacent prominence on interstria 4. The prominence is low, elongate and curved in the non-navicular *L. santarosae*; it is obsolete in *L. myrmecodes*.

8) Elytral interstria 3 is slightly curved and clothed with dense white scales in the non-navicular *L. martinsi*, *L. santarosae* and *L. myrmecodes* (Figs. 20, 22, 24).

9) The elytra are narrow at the base and inflated posteriorly, and the pronotum and elytra are smooth, sparsely punctate and nearly glabrous except for the dense scales on elytral interstria 3 in the non-navicular *L. santarosae* and *L. myrmecodes* (Figs. 21–24).

Intergeneric relationships.— Champion (1903: 151) indicated that he thought the genera *Rhinolius* Chevrolat, *Omogonus* Chevrolat and *Atractomerus* Duponchel and Chevrolat, are allied to *Loncophorus*. The holotypes of the type species of each of these genera (NHRS) were examined in connection with this study. The type species of *Rhinolius* is a member of the subfamily Baridinae, as noted by Kuschel (1955: 272). The type species of *Omogonus* is an anthonomine, but there is no indication that it is closely related to *Loncophorus*. Adults have a single, large, ventral profemoral tooth quite unlike that of adult *Loncophorus*. Adults of *A. nigrocalcaratus* Duponchel and Chevrolat, the type species of *Atractomerus*, have a similar profemoral tooth. Voss (1944) did not mention this species in his treatment of *Atractomerus* and it is doubtful that he saw specimens of it. He transferred Champion's *L. fusiformis* and *L. nitidus* to *Atractomerus*. One of these, *L. fusiformis* has well-developed prothoracic postocular lobes, an emarginate profemoral tooth and subtrapezoidal mesotrochanters and is returned, without hesitation, to *Loncophorus*. Conversely, adults of *A. nitidus* lack prothoracic postocular lobes, have a simple profemoral tooth, lack subtrapezoidal mesotrochanters, and have an endophallic armature very unlike that of any of the species of *Loncophorus*. Furthermore, the species is associated with *Bunchosia macrophylla* Rose (Malpighiaceae) (Pierce 1916: 468), rather than with Bombacaceae like the species of *Loncophorus*. Although *A. nitidus* does not appear to be very closely related to *A. nigrocalcaratus*, it seems best to leave it in *Atractomerus*. The relationships of these and other species that appear to be allied to *A. nigrocalcaratus* are presently under investigation.

The Costa Rican *L. verruciger* (Champion 1903: 154) may also be closely related to at least one of the species presently in the genus *Atractomerus*. Like *A. nitidus*, the adult of *verruciger* is navicular in form. Lending additional, though probably superficial, similarity to *A. nitidus*, the adult of *L. verruciger* lacks well-developed prothoracic lobes and has large areas of smooth, dark, shining integument on the pronotum and elytra. However, in the armature of the endophallus, which consists of a series of large spines, and in the structure of the profemoral tooth, which is large and conical with a small basal cusp, specimens of *L. verruciger* are unlike those of *A. nitidus* and of the species of *Loncophorus*. The profemoral tooth is unlike the large simple tooth in adults of *A. nigrocalcaratus*, but resembles that in the Brazilian *A. dromedarius* Voss. Like *A. dromedarius*, *L. verruciger* has large tuberosities on the elytra, and the species is transferred, with some reluctance, to *Atractomerus* as *A. verruciger* (Champion), new combination.

Discovery of species of *Loncophorus* with non-navicular adults raises questions about the relationship of the species of *Loncophorus* to certain species in the genus *Anthonomus* Germar. In lacking the navicular form, and in their relatively small size, adults of these *Loncophorus* superficially resemble many members of that large genus. As presently constituted, however, the genus *Anthonomus* is clearly "a catchall for species that do not easily fit into other genera" (Burke 1976). The genus

appears to be characterized only by the absence of features that distinguish the other recognized genera of Anthonominae. This problem cannot be solved without extensive study of phylogenetic relationships of Anthonominae that are not likely to be completed soon. It seems, however, that clarification of the relationship of the species of *Loncophorus* to the species in the *Anthonomus* subgenus *Anthonomorphus* would be a major contribution to its resolution. Adult males of the species of *Anthonomorphus*, like *L. martinsi*, *L. santarosae* and *L. myrmecodes*, have prominent mesotrochanters (Clark and Burke 1986b). Furthermore, the larvae and pupae of the species of *Anthonomorphus* differ only slightly from those of *L. fusiformis* and *L. santarosae* (Clark and Burke 1986a). It seems possible, in fact, that the species of *Anthonomorphus* might actually belong in a monophyletic group containing *L. martinsi*, *L. santarosae* and *L. myrmecodes*. This is especially intriguing in light of the close but as yet unspecified relationship of *Anthonomus grandis* to the species of *Anthonomorphus* (Clark and Burke 1986b).

Plant associations.— Several species of *Loncophorus* have been reported to have hosts in the plant family Bombacaceae (Ahmad and Burke 1972; Bondar 1937; Burke 1968; Clark and Burke 1986a; Costa Lima 1943, 1968; Mendes 1938; Pierce 1916). The following plant taxa are indicated by these authors and by label data on specimens to be hosts of the weevils. The list is probably far from complete, and there is no way to verify the identities of all of the plants. Furthermore, there are no data on plant associations of some of the species. Nevertheless, the list does give a good indication that larval development of the species of *Loncophorus* is restricted to the Bombacaceae.

Bombacopsis Pitt.

Bombacopsis quinata (Jacq.) Dugand

Bombacopsis sessilis (Benth.) Pitt.

Bombax endecaphyllum Vell. (imbirussú)

Ceiba pentandra (L.) Gaertn. (= *Ceiba ceiba*: ceibo, kapok, paineira)

Ceiba P. Mill.

Chorisia speciosa A. St-Hil. (paina or parvana de seda)

Chorisia Kunth.

Eriotheca Schott & Endl.

Pachira Aubl.

Pachira aquatica Aubl.

Pachira insignis Savigney (carolina)

Pseudobombax longiflorum

Larvae of *L. obliquus*, *L. varius* and *L. chevrolati* are reported to develop in the fruits of these plants, whereas larvae of *L. fusiformis*, *L. pustulatus* and *L. martinsi* are known to develop in flower buds.

Nomenclature.— Chevrolat (1832a: 220) cited Germar (1824: 106) as having proposed the name *Loncophorus* for a genus of “Lamellicornes,” but noted that the name *Phanaeus* MacLeay had priority. Schönherr (1838: 1123), however, indicated that he thought the name *Loncophorus* should replace the name *Loncophorus* Chevrolat. O’Brien and Wibmer (1982: 112) and Wibmer and O’Brien (1986: 202) listed the name *Loncophorus* Schönherr (1838: 1123) as an unjustified emendation.

Checklist of species of *Loncophorus*

1. *Loncophorus obliquus* Chevrolat (Argentina, Brazil, Costa Rica, Ecuador, Nicaragua, Panamá, Paraguay, Trinidad, Venezuela)
Loncophorus ecuadorius Marshall
Loncophorus marshalli Costa Lima, **new synonymy**
2. *Loncophorus daviesii* (Swederus) (Cuba)
Rhynchaenus stigma Olivier
Loncophorus petiminosus Germar
Loncophorus humeralis Chevrolat
3. *Loncophorus longinasus* Costa Lima (Brazil)
4. *Loncophorus varius* (Fabricius) (Brazil, French Guiana, Surinam)
Curculio parasita Fabricius
Curculio nigromaculatus Voet
Curculio flavomaculatus Voet
Curculio thoracicus Panzer
5. *Loncophorus fortis* (Champion) (Bolivia, Panamá, Venezuela)
6. *Loncophorus chevrolati* Gyllenhal (Brazil)
7. *Loncophorus pustulatus* (Champion) (Brazil, El Salvador, México, Nicaragua, Panamá, Paraguay, Peru, Venezuela)
Loncophorus fluminensis Costa Lima, **new synonymy**
8. *Loncophorus crossi*, **new species** (México)
9. *Loncophorus fusiformis* (Champion) (Brazil, Colombia, El Salvador, Guatemala, México, Panamá, Peru, Trinidad, Venezuela)
10. *Loncophorus costalimai*, **new species** (Brazil)
11. *Loncophorus martinsi*, **new species** (Brazil, French Guiana, Paraguay)
12. *Loncophorus santarosae* (Clark), **new combination** (Costa Rica)
13. *Loncophorus myrmecodes*, **new species** (Panamá)

Key to Species of *Loncophorus*

- | | | |
|-------|--|---|
| 1 | Prosternum extended ventrally in front of procoxae | 2 |
| 1' | Prosternum not extended ventrally in front of procoxae | 6 |
| 2 (1) | Elytra with dense, white scales forming large, interconnected, | |

- discal and declivital maculae (Figs. 2,4) 3
- 2' Elytra with scales mostly fulvous, more diffuse, or, if dense, not forming interconnected discal and declivital maculae (Figs. 6, 8) 4
- 3 (2) Elytra with sides gradually convergent behind obtusely prominent humeri (Fig. 2); pygidium of female foveate apicomediaally (Fig. 43)
.....*L. obliquus* Chevrolat, p. 476
- 3' Elytra subparallel sided behind more strongly, acutely prominent humeri (Fig. 4); pygidium of female not foveate apicomediaally *L. daviesii* (Swederus), p. 479
- 4 (2') Elytral humeri acutely prominent; rostrum of female extremely long and slender, length (measured across the arc) ca. 1.5 x longer than body *L. longinasus* Costa Lima, p. 481
- 4' Elytral humeri obtusely prominent (Fig. 6, 8); rostrum of female shorter, length ca. 0.5–1.0 x body length 5
- 5 (4') Elytral prominences and depressions pronounced, dense scales forming discrete discal and declivital maculae (Fig. 8); rostrum of female relatively short, length ca. 0.5 x body length
..... *L. fortis* (Champion), p. 486
- 5' Elytral prominences and depressions less pronounced; elytral scales fasciculate, not in discrete discal and declivital maculae (Fig. 6); rostrum of female longer, length ca. 1.0 x body length
..... *L. varius* (Fabricius), p. 483
- 6 (1') Elytra with discrete discal and declivital maculae of dense, pallid scales (Fig. 10) *L. chevrolati* Gyllenhall, p. 487
- 6' Elytra with scales dense in interconnected middorsal and declivital maculae (Figs. 12, 14), or, diffuse (Figs. 16, 18) 7
- 7 (6') Elytra with scales dense in discrete, interconnected middorsal and declivital maculae (Figs. 12, 14); elytral interstria 4 with elongate discal pustule; frons sulcate 8
- 7' Elytra with scales diffuse (Figs. 16, 18); elytral interstria 5 with rounded pustule or slightly elevated section in basal 1/4; frons not sulcate 9
- 8 (7) Basal portions of elytral interstriae 4–6 with large distinct scales like those on discal macula (Fig. 14); aedeagus with apicolateral prominences (Fig. 31).
..... *L. crossi*, new species, p. 491
- 8' Basal portions of elytral interstriae 4–6 with small, indistinct scales unlike those on discal macula (Fig. 12); aedeagus without apicolateral prominences (Fig. 30)
..... *L. pustulatus* (Champion), p. 489

- 9 (7') Elytra widest slightly behind humeri, sides slightly convergent posteriorly (Fig. 16); prothorax with well-developed postocular lobes; elytral interstriae with slightly but distinctly elevated and slightly depressed portions*L. fusiformis* (Champion), p. 493
- 9' Elytra subparallel sided to slightly convergent behind humeri (Figs. 18, 20), or, narrow at base and widened posteriorly (Figs. 22, 24); prothorax with feebly developed postocular lobes; elytral interstriae without distinctly contrasting elevated and depressed portions 10
- 10 (9') Elytra narrow at base, inflated posteriorly (Fig. 24); elytral interstriae flat, smooth, glabrous, except for dense white scales on basal portion of interstria 3 and around apices; abdominal sterna of male with long, dense, curved, suberect setiform scales; metatibia of male narrowed apically (Fig. 42); abdominal sternum 5 of male broadly emarginate posteriorly; pygidium of male truncate apically, without apicomedian emargination*L. myrmecodes*, new species, p. 498
- 10' Elytra broader at base, subparallel sided (Fig. 20), or, sides slightly convergent posteriorly (Fig. 18), or, less strongly inflated posteriorly (Fig. 22); elytral interstriae slightly to markedly convex, scales sparse to subfasciculate, not limited to basal portion of interstria 3 and to apices; abdominal sterna of male with sparse, recumbent, elongate scales; metatibia of male not narrowed apically; abdominal sternum 5 of male straight on posterior margin; pygidium of male rounded 11
- 11 (10') Elytra without posterolateral integumentary maculae; elytral interstria 5 with smooth, shining, elongate elevation slightly posterior to base, not pustulate;*L. santarosae* Clark, p. 497
- 11' Elytra with dark, posterolateral integumentary maculae (Figs. 19, 20); elytral interstria 5 without elongate elevation slightly posterior to base, with small discal pustule 12
- 12 (11') Metatibia of male constricted subapically (Fig. 41); mesotrochanters of male prominent (Fig. 40); elytral scales most dense on interstria 3, not dense on declivities (Fig. 20); pygidium of female with narrow apicodorsal prominence (Fig. 46)*L. martinsi*, new species, p. 495
- 12' Metatibia of male not constricted subapically; mesotrochanters of male not prominent; elytral scales not dense on interstria 3, dense on declivities (Fig. 18); pygidium of female without apicodorsal prominence*L. costalimai*, new species, p. 494

Loncophorus obliquus Chevrolat

(Figs. 1, 2, 25, 37, 39, 43, 47, 48)

Loncophorus obliquus Chevrolat 1832a: 218, t. 5, Figs. 1,1a,b. *Lectotype* (here designated): male, Brazil, ("Brasilia (Rio-Janeiro)"), [329/ 85] [RIKSMUSEUM/ STOCKHOLM] (NHRS). *Paralectotypes*: Brazil, 1 male, 3 females [329/ 85] [RIKSMUSEUM/ STOCKHOLM] (NHRS). Gyllenhal 1836: 392. Dejean 1837: 304. Laporte 1840: 343. Pierce 1916: 148. Costa Lima 1943: 120, 122, 123, Fig. 6; 1955: 50, 51, 52, 53, Figs. 3, 4 (= *ecuadorius* Marshall). Blackwelder 1947: 837. O'Brien and Wibmer 1982: 112. O'Brien and Wibmer 1984: 293 (= *ecuadorius* Marshall). Wibmer and O'Brien 1986: 202 (= *ecuadorius* Marshall).

Loncophorus obliquus (Chevrolat). Schönherr 1843: 293. Lacordaire 1863: 578. Gemminger and Harold 1871: 2498. Champion 1903: 152. Marshall 1933: 65. Schenkling and Marshall 1934: 4. Gomes 1936: 42. Bondar 1937: 481. Mendes 1938: 489. Voss 1944: 41.

Loncophorus chevrolati Gyllenhal. Pierce 1916: 468. Incorrect identification. Wibmer and O'Brien 1986: 202.

Loncophorus ecuadorius Marshall 1933: 65. *Lectotype* (here designated): male, Ecuador [Type] [Pambilar/ N.W. Ecuador/ 60 ft] [Loncophorus/ ecuadorius (*sic*), Mshl./ Type ♂] [G.A.K. Marshall/ Coll./ B.M.1950–255.] (BMNH). *Paralectotypes*: Ecuador, 1 male [Co-/ type] [Pambilar/ N.W. Ecuador/ 60 ft] [Loncophorus/ ecuadorius, Mshl./ Cotype -] [G.A.K. Marshall/ Coll./ B.M.1950–255.] (BMNH); 3 females [Co-/ type] [Pambilar/ N.W. Ecuador/ 60 ft] [Loncophorus/ ecuadorius, Mshl./ Cotype ♀] [G.A.K. Marshall/ Coll./ B.M.1950–255.] (BMNH); 2 males [Pambilar/ N.W. Ecuador/ 60 ft] [Loncophorus/ ecuadorius, Mshl./ Cotype ♂] [G.A.K. Marshall/ Coll./ B.M.1950–255.] (BMNH); 8 females [Pambilar/ N.W. Ecuador/ 60 ft] [Loncophorus/ ecuadorius, Mshl./ Cotype ♀] [G.A.K. Marshall/ Coll./ B.M.1950–255.] (BMNH). Schenkling and Marshall 1934:4.

Loncophorus ecuadorius (Marshall 1933). Costa Lima 1943: 120.

Loncophorus marshalli Costa Lima 1955: 54. *Holotype*: female, Brazil [10.951] [Esc. Nac Agr./ Km. 47/ IX 952/ Dr. C. Lima] (IBUS). Wibmer and O'Brien 1986: 202. New synonymy.

Recognition (Figs. 1, 2).— Specimens of *L. obliquus* are distinguished by the following combination of characters.

Elytral humeri prominent (Fig. 2); elytra with dense, mostly white scales forming large, interconnected discal and declivital maculae (Fig. 2); rostrum with dense scales distal to antennal insertion (Figs. 1, 2); prosternum extended ventrally in front of procoxae; aedeagus constricted subapically, with rounded apical prominence (Fig. 25); pygidium of female narrowed posteriorly, with apicomedian fovea (Fig. 43).

Adults are distinguished from those of the closely related *L. daviesii* by the longer, more slender body form and less markedly prominent elytral humeri (*cf.* Figs. 1–4) and by the slightly different shape of the aedeagus (*cf.* Figs. 25, 26). Furthermore, *L. daviesii* is known only from Cuba, whereas *L. obliquus* is widespread from Central America to southern Brazil (labels on specimens of *L. obliquus* indicating that the species was collected in Cuba are questionable, as are similar labels indicating the presence of *L. daviesii* in Brazil).

Male. *Length*: 7.8–10.8 mm (\bar{x} = 9.5, n = 15). *Width*: 3.6–4.9 mm (\bar{x} = 4.4, n = 15). *Head*: eyes separated by distance ca. 0.7 x width of rostrum at base. *Rostrum*: length 50–57% (\bar{x} = 53, n = 15) of total body length; length of distal portion 30–38% (\bar{x} = 34, n = 15) of total rostral length. *Prothorax*: interstriae slightly to

markedly convex to pustulate; punctures with narrow white or fulvous scales, the latter dense on dorsal midline; pleuron slightly excavated posterolaterally. *Abdomen*: sternum 5 longer than sternum 4, posterior margin concave medially. *Legs*: profemur ca. 1.1 x broader than metafemur, ventral tooth with shallow anterior emargination (Fig. 37); metatibia slightly expanded apically, apical mucro curved. *Genitalia*: (Fig. 25): aedeagus slightly asymmetrical, with complete dorsal closure in distal 1/3.

Female. *Length*: 8.5–12.2 mm (\bar{x} = 10.6, n = 15). *Width*: 3.6–5.6 mm (\bar{x} = 4.8, n = 15). *Rostrum*: length 80–105% (\bar{x} = 93, n = 15) of total body length; length of distal portion 51–63% (\bar{x} = 58, n = 15) of total rostral length. *Abdomen*: posterior margin of sternum 5 broadly emarginate lateromedially. *Genitalia*: ovipositor with short, broad, strongly sclerotized coxites bearing minute styli; foretube almost as long as apodeme of eighth sternite.

Type specimens.— The specimen designated as lectotype of *L. obliquus* is a male which stands first in a series of six specimens under the common label [Loncophorus/ obliquus Chevr. an. S. En. F.1 p 218/ Schr. 3, p. 392, 3. 7, 2, 293, 1./ Andrea Dej Cat/ Brasilia]. The third specimen in the series, a female with the tip of the rostrum broken off, is labelled (as are all of the others) with the same labels as the lectotype and, in addition, with the label [Brasilia/ Sommer/ 6 Juillet 34]. Assuming that this refers to the date of collection, 1834, this cannot belong to the type series of the species described in 1832. Chevrolat (1832a: Fig. 1, 1 a,b) illustrated *L. obliquus* with a dorsal view of the entire insect (1) and with a lateral view of the head and rostrum (1 a) and of an antenna (1 b). As noted by Champion (1903: 152), Fig. 1a undoubtedly represents a female, rather than a male, as stated by Chevrolat. The male specimen is selected as lectotype in spite of this figure because of the greater diagnostic value of characters of male anthonomines.

Marshall (1933: 65) claimed that males and females of *L. ecuadorius* differ from those of *L. obliquus* in respect to the length of the rostrum as compared to that of the body, and in the position of the antennal insertion. Examination of the type series of *L. ecuadorius*, however, indicates that the differences are not as great as Marshall implied. Comparisons of the specimens in the type series of *L. ecuadorius* and 15 male and 15 female specimens of *L. obliquus* (not including the type series of *L. ecuadorius*) are the following:

length of rostrum:

L. obliquus male, 50–57% (\bar{x} = 53), *L. ecuadorius* male, 53–56% (\bar{x} = 55) of total body length;

L. obliquus female, 80–105% (\bar{x} = 93), *L. ecuadorius* female, 93–103% (\bar{x} = 99) of total body length;

length of distal portion of rostrum:

L. obliquus male, 30–38% (\bar{x} = 34), *L. ecuadorius* male, 34–37% (\bar{x} = 35) of total rostral length;

L. obliquus female, 51–63% (\bar{x} = 58), *L. ecuadorius* female, 55–66% (\bar{x} = 60) of total rostral length.

The sexual dimorphism in the shape of the prothorax attributed by Marshall to *L. obliquus* is not evident in the specimens examined. Marshall asserted that the pygidium of the male of *L. obliquus* is “much narrowed towards the apex,” whereas that of *L. ecuadorius* is “suborbicular,” but the specimens of *L. obliquus* examined do not differ from the types of *L. ecuadorius* in this respect. Marshall also stated that the pygidium of adult female of *L. ecuadorius* is “broadly exposed,” whereas in *L. obliquus* it is “not exposed.” In some of the females of *L. ecuadorius*, the pygidium is exposed because the entire abdomen is distended, while in others it is not exposed. It also appears that the characters of the front tibiae ascribed to *L. ecuadorius* are actually those of, and not significantly different from, the condition in *L. ecuadorius*. The specimens of *L. ecuadorius* are somewhat larger than the specimens of *L. obliquus* from Brazil, but are not larger than those from Panamá. It seems best to follow Costa Lima’s (1955: 52) suggestion to treat *L. ecuadorius* as a synonym of *L. obliquus*.

The greasy condition of the holotype of *L. marshalli* obscures what would be a distinct contrast between dark integument and pallid vestiture characteristic of *L. obliquus*, and the specimen appears to be nothing more than an unusually small (length 7.5 mm) specimen of that species. A note in the card file associated with the Costa Lima collection indicates that the specimen was collected in Costa Lima’s office - on his desk!

Intraspecific variation.— The female specimens of *L. obliquus* from Venezuela differ from all others examined in having the rostrum much shorter in relation to the body (length of rostrum 68–74% [\bar{x} = 71] of total body length).

Natural history.— Label data and published records indicate that the following Bombacaceae are hosts of *L. obliquus*:

Ceiba pentandra (= *Ceiba ceiba*: kapok, paineira): fruit (Misiones, Argentina; Panamá [Pierce 1916: 148]; Paraguay);

Chorisia speciosa (paina or parvana de seda): fruit (Rio de Janeiro, Brazil; São Paulo, Brazil [Bondar 1937: 481, Mendes 1938: 489]; Minas Gerais, Brazil; Paraguay);

Chorisia sp.: fruit Paraná, Brazil);

Pseudobombax longiflorum: larvae, pupae and adults from fruit (Minas Gerais, Brazil).

Ing. A. L. Lourenção of the Instituto Agrônômico, explained (*in litt.*) that an association of *L. obliquus* with *Carya illinoensis* (see distribution section) in Campinas, Brazil, refers to specimens collected by Dr. P.V.C. Bittencourt on stems but that the weevils were not reared from the plants.

Adult *A. obliquus* have been collected in every month of the year; August, September and October account for 38 per cent of the records.

Distribution.— Specimens of *L. obliquus* have been collected in Argentina, Brazil, Costa Rica, Ecuador, Nicaragua, Panamá, Paraguay, Trinidad and Venezuela (Figs. 47, 48). In addition to the type series of *L. obliquus*, *L. ecuadorius* and *L. marshalli*, specimens from the following localities were examined. “Amer. Mer.” (1 female, USNM). **Argentina.** *Jujuy*: Fraile Pintado (1 female, USNM). *Misiones*. (1 female, CWOB); Santo Pipo (6 males, 2 females, NZAC). **Brazil.** (2 females, ZMHB; 1 female, DEIC); Puerto Piray, Alto Paraná (1 male, NZAC). *Goiás*: Jataí (1 male, 1 female, DEIC). *Minas Gerais*: Caldas (3 males, IBUS; 1 female, AMNH). Lavras (1 female, 2 females, MZSP); 5 km NW Paraopeba (11 male, 16 females, AUEM); Pouso Alegre (1 female, MZSP). *Paraná*: (1 male, DEIC); Jacarézinho (3 males, 7 females); Rolândia (4 males, 1 female, MZSP). *Rio de Janeiro*: (1 male, BMNH; 1 male NZAC; 1 male, 7 females, DEIC); Corcovado (1 female, DZUP); Escola Nacional Agrícola, Km. 47 (2 males, 4 females, IBUS); Escola Superior de Agrícola (1 male, 6 females, IBUS); Floresta de Tijuca (1 male, DZUP); Guaratiba (5 males, 6 females, IBUS); Represa Rio Grande (14 males, 21 female, CCBM, 1 female, IZAV). *Santa Catarina*: Nova Teutônia (1 male, MZSP). *São Paulo*: Brotas (3 males, 3 females, IBUS); Cajital (1 male, 1 female, MZSP); Campinas (1 female, IBUS); (2 males, 5 females, IACC); Escola Nacional Agrícola (1 female, IBUS); Itararé (5 males, 6 females, MZSP); Itaici (2 males, 2 females, CWOB); Piracicaba (1 male, USNM); Ribeirão Preto (2 females, IACC); Vera Cruz (4 males, 4 females, MZSP). **Costa Rica.** Hamburg Farm, Reventazón, Ebene Limón (1 male, USNM). **Cuba** (probably in error). (1 female, DEIC). **Nicaragua.** San Francisco J. Mankins (1 female, USNM). **Panamá:** Canal Zone: “imported into Texas from Panama” (2 females, USNM [see Pierce 1916: 468]); Barro Colorado Island (1 male, USNM; 1 male, 1 female, CNCI; 20 males, 20 females, CWOB; 1 male, CHAH); Coco Solo Hospital (1 female, CWOB). **Paraguay.** (1 female, DEIC); Asunción (3 males, USNM); San Bernardino (1 female, USNM); illegible locality (1 male, AMNH); Villarica (1 female, AMNH). **Trinidad.** Arima Valley (1 male, AMNH). **Venezuela.** *Aragua*: El Limón (1 female, IZAV); Rancho Grande (1 female, IZAV). *Carabobo*: Hidalgo El Palmar, Las Trincheras (2 females, IZAV).

Loncophorus daviesii (Swederus)

(Figs. 3, 4, 26, 47)

Curculio daviesii Swederus 1787: 194, t. 8, f. 5. *Neotype* (here designated): male, Cuba [MLU Halle/ WB Zoologie/ T.-Nr. 913123/ T.-Nr.] (MLUH). Gmelin 1790: 1773.

Loncophorus daviesi (Swederus 1787). Schenkling and Marshall 1934: 4.

Loncophorus daviesi (Swederus 1787). Blackwelder 1947: 837.

Loncophorus daviesii (Swederus 1787). Pierce 1916: 468 (= *Rhynchaenus stigma* Olivier, *L. petiminosus* Germar). Costa Lima 1943: 119. Costa Lima 1955: 51 (= *humeralis* Chevrolat, *petiminosus* Germar). O'Brien and Wibmer 1982: 112. O'Brien and Wibmer 1984: 292–293 (= *humeralis* Chevrolat, *petiminosus* Germar).

Loncophorus humeralis Chevrolat 1832b: 442–443. *Lectotype* (here designated): female, Cuba [TYPUS] [336/ 85] [Riksmuseum/ Stockholm] (NHRS). *Paralectotype*: Cuba, 1 female, [Loncophorus/ petiminosus/ Germar, humeralis Klug.] [C. Daviesi (sic)/ Sw. nact (?)/ Stock 1788./ p 186, 1715 (?)] [336/ 85] [Riksmuseum/ Stockholm] (NHRS). Pierce 1916: 468. Costa Lima 1943: 119, 120 (= *petiminosus* Germar); 1955: 51 (= *daviesii* Swederus, *petiminosus* Germar). Blackwelder 1947: 837 (= *petiminosus* Germar). O'Brien and Wibmer 1982: 112 (= *petiminosus* Germar); 1984 (= *daviesii* Swederus, *petiminosus* Germar).

Loncophorus petiminosus Germar 1836: 395–396 (= *daviesii* Swederus 1787). *Lectotype* (here designated): male, Cuba [MLU Halle/ WB Zoologie/ S.-Nr. 913123/ T.-Nr.] (MLUH). *Paralectotype*: Cuba, 3 females, [MLU Halle/ WB Zoologie/ S.-Nr. 913123/ T.-Nr.] (MLUH). Dejean 1835: 280; 1837: 304 (= *humeralis* Gyllenhal). Costa Lima 1955: 51 (= *daviesii* Swedruss, = *humeralis* Chevrolat). O'Brien and Wibmer 1982: 112 (= *humeralis* Chevrolat; 1984: 292–293 (= *daviesii* Swederus, *humeralis* Chevrolat).

Loncophorus petiminosus (Germar, 1836). Schönherr 1843: 293 (= *humeralis* Chevrolat). Lacordaire 1863: 578. Gemminger and Harold 1871: 2498 [= *daviesi* (sic) Swederus]. Suffrian 1871: 147–148. Gundlach 1891: 290.

Loncophorus humeralis (Chevrolat 1832b). Schönherr 1836: 395.

Loncophorus humeralis (Chevrolat 1832b). Lacordaire 1863: 578. Gemminger and Harold 1871: 2498.

Heyne and Taschenberg 1908: 230, Fig. 27 (= *daviesi* (sic) Swederus]. Schenkling and Marshall 1934: 4 (= *petiminosus* Germar). Voss 1944: 41.

Recognition (Figs. 3, 4).— Specimens of *L. daviesii* are distinguished by the following combination of characters.

Elytral humeri markedly, acutely prominent (Fig. 4); elytra with dense, mostly white scales forming large, interconnected discal and declivital maculae (Fig. 4); rostrum with dense scales distal to antennal insertion (Figs. 3, 4); prosternum extended ventrally in front of procoxae; aedeagus constricted subapically, with rounded apical prominence (Fig. 26); pygidium of female narrowed posteriorly, without apicomedian fovea.

Apparently restricted to Cuba, *L. daviesii* may be only a geographical variant of the more widely distributed *L. obliquus*. Specimens of the two are distinguished by the characters listed in the section on recognition of the latter species.

Male. *Length:* 9.4–10.0 mm (\bar{x} = 9.7, n = 5). *Width:* 4.8–5.3 mm (\bar{x} = 5.1, n = 5). *Head:* eyes separated by distance ca. 0.5 x width of rostrum at base. *Rostrum:* length 49–54% (\bar{x} = 51, n = 5) of total body length; length of distal portion 30–33% (\bar{x} = 32, n = 5) of total rostral length. *Prothorax:* interstriae slightly to markedly convex to pustulate; punctures with narrow white or fulvous scales, the latter dense on dorsal midline; pleuron slightly excavated posterolaterally. *Abdomen:* sterna 4 and 5 subequal in length, posterior margin of 5 slightly concave. *Legs:* profemur ca. 1.3 x broader than metafemur; metatibia slightly expanded apically, apical mucro curved. *Genitalia* (Fig. 26): aedeagus narrow, symmetrical, with nearly complete dorsal closure in distal 1/3.

Female. *Length:* 8.2–11.0 mm (\bar{x} = 9.8, n = 13). *Width:* 4.0–5.5 mm (\bar{x} = 5.1, n = 13). *Rostrum:* length 61–100% (\bar{x} = 83, n = 13) of total body length; length of distal portion 53–60% (\bar{x} = 57, n = 13) of total rostral length. *Abdomen:* posterior margin of sternum 5 broadly emarginate lateromedially. *Genitalia:* ovipositor with short, broad, markedly sclerotized coxites bearing minute styli; foretube almost as long as apodeme of eighth sternite.

Type specimens.— The neotype of *L. daviesii*, designated above, is also the lectotype of *L. petiminosus* Germar. The specimen Swederus (1787: 194, t. 8, f. 5) described and illustrated as *L. daviesii* has not been located. The species is assumed to be the same as *L. petiminosus* following Germar (1836: 395) who listed *C. daviesii* as a junior synonym, citing Swederus (1787: 194, t. 8, f. 5), Gmelin (1790: 1773) and Olivier (1807: 197, pl. 8, Fig. 87). According to P. I. Persson of the Stockholm Museum (*in litt.*), Nils Samuel Swederus (1751–1833) was a Swedish priest with an entomological collection. Although nothing is now known of that collection, it is clear that the species in question was not described from specimens in it. Swederus was in London in about 1785 and there examined the collection of a Mr. Davies from which *C. daviesii* was described. In a subsequent paper Swederus

(1788: 203) wrote (in Persson's translation) "This peculiar insect (not *C. daviesii*) is kept in Mr. Davies' beautiful Natural history collection at Blackheath near the town of Greenwich in England. I have also to thank the Mr. colonel himself for the nice picture of it." The illustration referred to is not that published in Swederus (1787: pl. 8, Fig. 5), but probably had a similar origin. R.T. Thompson of the British Museum, London, in response to an inquiry on Mr. Davies, referred to Askwith (1900) who put Lieutenant-General Thomas Davies in North America in military actions associated with the British conquest of Canada and the American Revolution. This provides no explanation as to why Davies should have had a Cuban insect in his collection, but does indicate that Swederus' unexplained original citation of "New York Americae" as the type locality might have been correct. This confusion over the origin of Davies' specimen is interpreted as an "exceptional circumstance" justifying designation of a neotype under the provisions of Article 75, ICZN.

Pierce (1916: 468) listed "*Rhynchaenus stigma* Olivier (not *Curculio stigma* Linnaeus 1767) as a junior synonym of *L. daviesii*. The type specimens of this species were not examined. Pierce was referring to Olivier's (1807: 197) citation of *Curculio daviesii* Swederus under *Rhynchaenus stigma* (Linnaeus). Olivier provided two illustrations of this insect (Olivier 1807: pl. 8, Fig. 87, and pl. 34, Fig. 530). The first is a copy of Swederus' (1787: tab. 8, Fig. 5). The second is not the same insect. The weevil referred to as *Rhynchaenus stigma* is *Rhinochenus stigma* (L.) (Cryptorhynchinae) (Whitehead (1976: 156)).

The four syntypes of *L. petiminosus* are without labels except for recently applied ones. These specimens are conspecific with the specimens in the Costa Lima collection (IBUS) identified as *L. petiminosus* and with specimens (MLUH) Suffrian (1871: 147–148) apparently had before him when he wrote about the same species. The type specimens of *L. humeralis* represent the same species as do those of *L. petiminosus*.

Natural history.—Gundlach (1891: 290) reported that he collected specimens of *L. daviesii* (identified as *L. petiminosus*) in seeds of "la Ceiba" (*Ceiba pentandra*). Label data indicate that specimens have been collected in May and June.

Distribution.—Specimens of *A. daviesii* have been collected in Cuba (Fig. 47), and there is a doubtful record from Brazil. The types of *L. petiminosus* and *L. humeralis* from Cuba and specimens from the following localities were examined. **Brazil** (probably in error). (1 female, DEIC). **Cuba**. (1 female, BMNH; 1 male, 1 female, DEIC; 1 male, 1 female, MLUH; 1 male, NZAC; 1 female, USNM; 3 males, 4 females, ZMHB). **La Habana**: (2 females, IBUS); Cerro Habana (1 female, USNM); Santiago de las Vegas, (1 male, IBUS). **Pinar del Rio Artemisa** (1 male, IBUS).

Loncophorus longinasus Costa Lima (Figs. 27, 48)

Loncophorus longinasus Costa Lima 1955: 54, Figs. 1, 2. *Holotype*: female, Brazil [(a large, folded label with illegible script)] [*Loncophorus/ longinasus/ sp n./ Costa Lima det.*] [(a large, red, rectangular, blank label)] [5789] (FIOC). Costa Lima 1956: 24, 149, 343, cover illustration. Wibmer and O'Brien 1986:

202.

Recognition.— Adults of *L. longinasus* are distinguished by the following combination of characters.

Elytra widest at slightly, acutely prominent humeri; rostrum of female extremely long, slender, length (measured across the arc) ca. 1.5 x longer than total body length; elytral interstria 5 with small anteromedian fascicle of white scales; elytra with fulvous scales in discrete humeral and declivital maculae; prosternum extended ventrally in front of procoxae; aedeagus constricted subapically, with rounded apical prominence (Fig. 27); pygidium of female narrowed posteriorly, without apicomedian fovea.

The remarkably long rostrum of the adult female is truly a distinguishing feature.

Male. *Length:* 10.4 mm ($n = 1$). *Width:* 4.0 mm ($n = 1$). *Head:* eyes separated by distance ca. 0.5 x width of rostrum at base. *Rostrum:* length 54% ($n = 1$) of total body length; length of distal portion 39% ($n = 1$) of total rostral length. *Prothorax:* pronotum with shallow posterolateral depressions; interstriae slightly to markedly convex; punctures with narrow, pallid to dark fulvous scales, the latter dense on dorsal midline; pleuron markedly excavated posterolaterally. *Abdomen:* sterna 4 and 5 subequal in length, posterior margin of 5 straight. *Legs:* profemur ca. 1.1 x broader than metafemur; metatibia slightly expanded apically, apical mucro short, curved. *Genitalia* (Fig. 27): aedeagus narrow, slightly asymmetrical, without dorsal closure.

Female. *Length:* 11.4–12.5 mm ($\bar{x} = 12.0$, $n = 3$). *Width:* 4.4–5.6 mm ($\bar{x} = 5.0$, $n = 3$). *Rostrum:* length 140–150% ($\bar{x} = 144$, $n = 3$) of total body length; length of distal portion 72–81% ($\bar{x} = 75$, $n = 3$) of total rostral length. *Abdomen:* sternum 5 distended posteriorly, posterior margin narrowly rounded. *Genitalia:* ovipositor long, length of foretube more than 2 x length of apodeme of eighth sternite; coxites long, slender, distinctly sclerotized, blade-like, without styli.

Type specimens.— Costa Lima (1956) used a line drawing of the holotype of *L. longinasus* to illustrate the frontispiece of his “Insectos do Brasil.”

Natural history.— No plant associations are reported for *L. longinasus* but the similarly large size and general resemblance of the adults suggest that larvae of the species will be found to develop, like those of *L. varius*, in fruits, probably of plants in the Bombacaceae. Specimens of *L. longinasus* have been collected in April, September, October and November.

Distribution.— Specimens of *L. longinasus* have been collected in Brazil (Fig. 48). Costa Lima (1955: 54) gave the type locality of *L. longinasus* as “Fonte Boa, Amazonas.” In addition to the holotype, the following specimens were examined. **Brazil.** *Amazonas:* Rio Prêto da Eva, prox. boca (1 female, MZS); Uypizanga, Río Negro, 14 km. from Manaus (1 male, AMNH). *Pará:* (1 male, 1 female, MZSP).

Loncophorus varius Fabricius

(Figs. 5, 6, 28, 38, 48)

Curculio varius Fabricius 1775: 142. *Holotype*: male, French Guiana [*varius*] (ZMUC). Fabricius 1781: 180; 1787: 109; 1792: 442. Olivier 1790: 515 (= *flavomaculata* Voet). Zimsen 1964: 208.

Rhynchaenus varius (Fabricius 1775). Fabricius 1801: 488; Illiger 1805: 148.

Loncophorus varius (Fabricius 1775). Gemminger and Harold 1871: 2498 (= *parasita* Fabricius, and "vars." *flavomaculatus* Voet, *nigromaculatus* Voet, *proboscideus* Panzer, *thoracicus* Panzer, *tessellatus* Dejean, and *varians* Gmelin). Champion 1903: 152 (= *parasita* Fabricius). Schenkling and Marshall 1934: 5 (= *parasita* Fabricius, *proboscideus* Panzer, *thoracicus* Panzer, and "vars." *flavomaculatus* Voet, *nigromaculatus* Voet, and *varians* Gmelin). Voss 1944: 41.

Loncophorus varius (Fabricius 1775). Blackwelder 1947: 837 (= *parasita* Fabricius, *proboscideus* Panzer, *thoracicus* Panzer, "v's." *flavomaculatus* Voet, *nigromaculatus* Voet, and *varians* Gmelin). Costa Lima 1943: 119–123, f. 1–5; 1955: 51 (= *parasita* Fabricius).

Curculio nigromaculata Voet 1806: 48, tab. 35, f. 5. Type specimens not examined, see discussion.

Curculio flavomaculata Voet 1806: 48, tab. 35, f. 6. Type specimens not examined, see discussion.

Curculio varians Gmelin 1790: 1767. Incorrect subsequent spelling of *C. varius* Fabricius.

Curculio parasita Fabricius 1792: 441. Type specimens not examined, see discussion. Dejean 1835: 280; 1837: 304 (= *varius* Fabricius, = *tessellatus* Dejean). Herbst 1795: 204–205 *varius* Fabricius, = *flavomaculata* Voet.

Rhynchaenus parasita (Fabricius 1775). Fabricius 1801: 487. Illiger 1805: 147. Olivier 1807: 218, pl. 15, f. 181.

Loncophorus parasita (Fabricius 1775). Chevrolat 1832a: 218–219, pl. 5, Figs. 2, 2a-c, 3, 3a (= *varius* Fabricius, *varius sensu* Olivier 1790: 515, *flavomaculatus* Voet, *nigromaculatus* Voet). Schönherr 1836: 394–395 (= *varius* Fabricius, = *nigromaculatus* Voet, = *flavomaculatus* Voet, *thoracicus* Panzer, = *varians* Gmelin). Laporte 1840: 343. Pierce 1916: 469.

Lonchophorus parasita (Fabricius 1775). Schönherr 1843: 293. Lacordaire 1863: 578.

Curculio thoracicus Panzer 1798: 50, tab. 35, f. 5. Type specimens not examined, see discussion.

Loncophorus virius Costa Lima 1943: 119. Incorrect subsequent spelling of *varius* Fabricius.

Recognition (Figs. 5, 6).— Specimens of *L. varius* are distinguished by the following combination of characters.

Elytra widest at obtusely prominent humeri (Fig. 6); elytral scales faciculate, not forming discrete discal and declivital maculae (Fig. 6); length of rostrum of female ca. 1.0 x total body length; prosternum extended ventrally in front of procoxae; aedeagus bent downward in lateral view, with apicolateral prominences (Fig. 28); pygidium of female with apicomedian fovea (*cf.* Fig. 44).

Adults of this species closely resemble those of *L. fortis*. In fact, Venezuelan specimens identified as *L. varius* are intermediate between the types of *L. fortis* and *L. varius* in some features. Specimens of the two species are distinguished as follows:

- 1) The rostrum of female is shorter in *L. fortis* (length of rostrum 49–56% [\bar{x} = 51] of total body length) than in *L. varius* (length of rostrum 83–105% [\bar{x} = 93] of total body length). The length of the rostrum in the specimens from Venezuela assigned to *L. fortis* is intermediate (length of rostrum 66–73% [\bar{x} =

69] of total body length).

2) The elytral prominence and depressions are less pronounced in *L. varius*. As a result, the maculae formed by pallid scales on the elytral depressions are less distinct (cf. Figs. 6, 8). The Venezuelan specimens are less obviously intermediate in this respect.

3) The apex of the aedeagus is less abruptly bent down apically in lateral view in *L. varius*. The Venezuelan specimens are not intermediate in this character.

4) As noted by Champion (1903: 152), specimens of *L. varius* are more elongate than those of *L. fortis* and have somewhat more slender legs.

5) The pygidium of the female is less markedly emarginate apicomediaally and more markedly foveate apicodorsally in *L. varius*.

Male. *Length:* 7.9–11.2 mm (\bar{x} = 9.9, n = 17). *Width:* 3.2–4.6 mm (\bar{x} = 4.0, n = 17). *Head:* eyes separated by distance ca. 0.8 x width of rostrum at base. *Rostrum:* length 43–58% (\bar{x} = 52, n = 17) of total body length; distal portion glabrous, length 24–33% (\bar{x} = 29, n = 17) of total rostral length. *Prothorax:* pronotum shallowly impressed posterolaterally; interstriae slightly to markedly convex; punctures with narrow fulvous scales; pleuron not excavated posterolaterally. *Abdomen:* sternum 5 longer than sternum 4, posterior margin slightly concave. *Legs:* profemur ca. 1.2 x broader than metafemur; metatibia flattened, slightly expanded apically, apical mucro short, oblique. *Genitalia* (Fig. 28): aedeagus with dorsal closure in distal 1/2; endophallus minutely denticulate.

Female. *Length:* 8.8–11.7 mm (\bar{x} = 10.3, n = 15). *Width:* 3.8–4.6 mm (\bar{x} = 4.2, n = 15). *Rostrum:* length 83–105% (\bar{x} = 93, n = 15) of total body length; length of distal portion 51–61% (\bar{x} = 56, n = 15) of total rostral length. *Abdomen:* posterior margin of sternum 5 broadly concave medially. *Genitalia:* ovipositor long, length of foretube more than 1/2 length of apodeme of eighth sternite; coxites slightly sclerotized, bearing minute styli.

Type specimens.— The concept of *L. varius* adopted here is based on examination of the holotype referred to by Zimsen (1964: 208). Zimsen made no reference to Fabricius' *C. parasita*, and the species is not represented in the Fabricius collection in Copenhagen. Fabricius (1792: 441) gave the type depository of *C. parasita* as "Mus. Dom. Geoffroy," but the species is not now represented in the Geoffroy collection in Paris (MNHN). The concept of *L. parasita* is based on examination of a male from "Cayenne" identified as *L. parasita* and labelled "comp. c. typo Kuschel 1953." Kuschel (*in litt.*) stated that he could not remember where the type was deposited. Apparently Fabricius considered *C. parasita* to be the same as a species previously treated by Olivier, since he cited "Oliv. Ins. 83. Fig. 181." This refers to the figure cited by Olivier (1790: 515) for *C. varius* Fabricius (1775: 142) and later by Olivier (1807: 218) for *Rhynchaenus parasita* Fabricius (1792: 441). Fabricius' (1792: 441) "Oliv. 83. Fig. 181" does not refer to an earlier work by Olivier (1789), even though Olivier (1790: 515) cited that work (as "Ent. ou hist.

nat. des ins. Charanson...”) and referred to “Pl. 15. Fig. 181.” under *C. varius*. The plate and figure number refer to the plate published by Olivier (1808) in a separate volume containing illustrations of species described by Olivier (1807). It is evident that the specimen upon which Olivier (1807: pl. 15, Fig. 181) is based is one Olivier (1790: 515) considered to be *C. varius* and which both Fabricius (1792: 441) and Olivier (1807: 218) considered to be *C. parasita*.

Herbst (1795: 204–205) and Chevrolat (1832a: 218–220) followed Olivier (1790: 515) in giving Fabricius’ *C. parasita* precedence over *C. varius*. Chevrolat (1832a: 219) stated that he had applied the name *L. dubius* to what he called *L. parasita* “var β” but that he subsequently decided that it was the same as *L. parasita*. He then provided a brief description of the insect. He also provided a separate description of what he called *L. parasita* “var τ.” Among the four specimens (2 males and 2 females) under the name “*Lonchophorus parasita*” in the Chevrolat collection (NHRS) are a male labelled [Parasita/ Var. β] and a female labelled [Var. τ/ /Cay]. These are all *L. varius* and Chevrolat was right not to consider the var β to be a different species. It appears that no one has used the name *L. dubius* since. Fortunately, the ICZN permits us to forget about this name which was expressly proposed for an infrasubspecific entity and has not been used otherwise.

The histories of the names *C. thoracicus* Panzer, *C. nigromaculatus* Voet, and *C. flavomaculatus* Voet, as well as *C. proboscideus* Fabricius (as attributed to Panzer), are all closely tied. Panzer’s (1798) tab. XXXV and Voet’s (1806) tab. XXXV are almost identical and appear to have been produced from the same plate with slight touching. Panzer’s (1798) Theil 4 includes, according to the catalog of the Library of the British Museum, descriptions of the figures on plates xxiii–xlxiii of Voet’s (1806) **Catalogus systematicus Coleopterorum**. According to the catalog, Voet died in 1778 at which time the **Catalogus** stood partially completed and no more had been completed by 1781. It appears that Panzer had access to the plates and published his own version (Panzer 1798), including tab. XXXV, prior to publication of the second volume of Voet’s **Catalogus** in which tab. XXXV appeared again. Figure 5 of tab. XXXV illustrates an insect which Panzer (1798: 50) called *Curculio thoracicus* and which Voet (1806: 48) called *Curculeo* [sic] *nigro maculata* [sic]. Figure 6 of tab. XXXV was called *Curculio proboscideus* by Panzer (1798: 50; citing Fabricius, 1775: 142, 1781: 180, 1787: 108, and 1792: 440) and *Curculeo* [sic] *flavo maculata* [sic] by Voet (1806: 48).

This explanation of the dates of publication of the various parts of Voet’s **Catalogus** is called into question by Olivier’s (1790: 515) citation of “Voet. Coleopt. pars. 2. tab. 35. Fig. 6,” which he considered to be *C. varius* Fabricius. Chevrolat (1832a: 219) and Schönherr (1836: 394) both considered the names *nigromaculatus* and *flavomaculatus* to be synonyms of *parasita*, citing Voet, “tom.” or “Col. 2,” and page 52 [sic], “pl. 35, Fig. 5 (6),” respectively, for the two insects. Gemminger and Harold (1871: 2498), Schenkling and Marshall (1934: 4) and

Blackwelder (1947: 1837) all list the names in question as synonyms of *L. varius*, consistently associating the name *thoracicus* with *nigromaculatus* and *proboscideus* with *flavomaculatus*. Blackwelder (1947: 1837) gave 1769 as the date of publication of the names *nigromaculatus* and *flavomaculatus*. Blackwelder had not seen the publication in question, however, citing “[From Horn.]” as his bibliographic source on Voet’s works. Schenkling and Marshall (1934: 4) also give 1769 as the date of publication of the names in question.

The identities of the species described and illustrated by Panzer and Voet cannot be confirmed because the specimens on which they are based have not been located (collections in Berlin, Leiden, London, and Stockholm have been checked). Both figures 5 and 6 of tab. XXXV depict insects that could very well be *L. varius*. Voet (1806: 48) stated, however, that *C. nigromaculata* is “ex India Occiden.” The identity of figure 6 as *L. varius* is also called into question by Panzer’s (1798: 50) identification of the insect as *C. proboscideus* (1775: 142, no. 78). This is now considered to be *Curculio proboscideus* Fabricius (O’Brien and Wibmer 1982: 103). A series of specimens in Berlin (ZMHB) under the name *C. proboscideus* in fact consists of specimens of *Curculio*, not anthonomines.

Natural history.— Label data and published records indicate that the following Bombacaceae are hosts of *L. varius*:

Pachira aquatica: adults in fruit (Surinam);

Pachira insignis (carolina): larvae, pupae and adults in fruit (Brazil [Costa Lima 1943: 1191]).

Adults have been collected in April and May.

Distribution.— Specimens of *L. varius* have been collected in Brazil, French Guiana, Guyana and Surinam (Fig. 48). In addition to the holotype of *L. varius*, specimens from the following localities were examined. “Amer. Mer.” (1 male, 1 female, USNM). **Brazil**. *Amazonas*: Pará-Manaus (5 males, 2 females, ZMBH). *Pará*: Cametá (1 male, ZMBH); Canindé, Rio Guripí (6 males, 6 females, CWOB, MZSP); Outubra (1 male, 3 females). *Pernambuco*: Costa Lima (1943: 119) referred to specimens from the Instituto de Pesquisas Agronômicas, Pernambuco. The 6 specimens labelled “8939” (IBUS) are probably among those specimens. **French Guiana** (Cayenne). (2 males, 2 females, NHRS; 1 male, 1 female, NZAC; 1 female, USNM; 1 male, 1 female, ZMHB); Saint Laurent (1 female, USNM). **Guyana**. *Bartico*: Kartabo (5 males, 4 females, AMNH). **Surinam**. Saramacca (1 male, 1 female, USNM).

Loncophorus fortis (Champion)

(Figs. 7, 8, 44, 48)

Loncophorus fortis Champion 1903: 152. *Lectotype* (here designated): female, Panamá, of two females mounted together on a single card, the one on the right-hand side [Sp. figured.] [♂] [Taboga Isl./Panama./Champion.] [B.C.A. Col. IV. 4./Loncophorus/fortis, Champ.] [Type] (BMNH). Schenkling and Marshall 1934: 4.

Loncophorus fortis (Champion 1903). Pierce 1916: 169. Costa Lima 1943: 120; 1955, 51. Blackwelder 1947:837). O’Brien and Wibmer 1982: 112.

Recognition (Figs. 7, 8).— Specimens of *L. fortis* are distinguished by the following combination of characters.

Elytra widest at obtusely prominent humeri (Fig. 8); elytra with dense scales in discrete discal and declivital maculae (Fig. 8); rostrum of female relatively short, length ca. 0.5 x total body length (Fig. 7); prosternum extended ventrally in front of procoxae; aedeagus bent downward in lateral view, with apicolateral prominences (cf. Fig. 28); pygidium of female with apicomedian fovea (Fig. 44).

They are distinguished from those of the closely related *L. varius* by the characters listed in the section on recognition of that species.

Male. *Length:* 8.0–9.8 mm (\bar{x} = 8.7, n = 8). *Width:* 3.4–4.2 mm (\bar{x} = 3.8, n = 8). *Head:* eyes separated by distance ca. 0.7 x width of rostrum at base. *Rostrum:* length 43–49% (\bar{x} = 46, n = 8) of total body length; distal portion glabrous, length 25–32% (\bar{x} = 28, n = 8) of total rostral length. *Prothorax:* pronotum shallowly impressed posterolaterally; interstriae slightly to markedly convex; punctures with narrow fulvous scales; pleuron not excavated posterolaterally. *Abdomen:* sternum 5 longer than sternum 4, posterior margin slightly produced medially. *Legs:* profemur ca. 1.2 x broader than metafemur; metatibia flattened, slightly expanded apically, apical mucro short, oblique. *Genitalia:* aedeagus with dorsal closure in distal 1/2; endophallus minutely denticulate.

Female. *Length:* 8.6–9.8 mm (\bar{x} = 9.1, n = 7). *Width:* 3.6–4.1 mm (\bar{x} = 3.9, n = 7). *Rostrum:* length 49–73% (\bar{x} = 59, n = 7) of total body length; length of distal portion 37–52% (\bar{x} = 42, n = 7) of total rostral length. *Abdomen:* posterior margin of sternum 5 broadly emarginate laterally. *Genitalia:* ovipositor long, length of foretube more than 1/2 length of apodeme of eighth sternite; coxites slightly sclerotized, bearing minute styli.

Natural history.— Label data indicate that the following Bombacaceae are hosts of *L. fortis*:

Bombacopsis sp.: adults feeding on fruit (Venezuela);

Pachira insignis (castaño): (Aragua, Venezuela).

Adults have been collected in January, February, September, and November. They were taken in UV light traps on Barro Colorado Island, Panamá.

Distribution.— Specimens of *L. fortis* have been collected in Bolivia, Panamá and Venezuela (Fig. 48). In addition to the type series, specimens from the following localities were examined. **Bolivia.** Chapare (1 male, NZAC). **Cuba** (probably in error). (1 male, ZMBH). **Panamá.** *Canal Zone:* Barro Colorado Island (2males, 2 females, CWOB; 1 female, CNCI). **Venezuela.** (1 female, USNM). *Aragua:* Quebrada Los Capuchinos, Rancho Grande (1 female, IZAV). *Barinas:* 15 km SW Barinitas (1 male, USNM). *Distrito Federal:* Caracas (2 males, 1 female, USNM; Caracas Valley (2 males, FMNH).

Loncophorus chevrolati Gyllenhal

(Figs. 9, 10, 29, 48)

Loncophorus chevrolati Gyllenhal 1836: 393–394, *Lectotype* (here designated): male, Brazil [(small square

of golden foil)] [*Lonchophorus/ Chevrolati*, Sch] (ZMAS). (Type locality originally stated to be "America meridionalis") *Paralectotypes*: Brazil, 1 male [♂] [TYPUS] [Brasília./ Westin.] [474/ 85] [Riksmuseum/ Stockholm] (NHRS); 1 female [♀] [ALLOTYPUS] [Brasília./ Westin.] [475/ 85] [Riksmuseum/ Stockholm] (NHRS). Costa Lima 1943: 119, 120; 1955: 50, 51, 52. Blackwelder 1947: 837.

Lonchophorus chevrolati (Gyllenhal 1836). Schönherr 1843: 293. Lacordaire 1863: 578. Gemminer and Harold 1871: 2495. Bondar 1937: 483.

Recognition (Figs. 9, 10).— Adults of *L. chevrolati* are distinguished by the following combination of characters.

Elytra with dense, pallid scales in discrete discal and declivital maculae, widest at obtusely prominent humeri (Fig. 10); prosternum not extended ventrally in front of procoxae; pygidium of female narrowed posteriorly, without apicomedian fovea.

They are relatively distinctive and not likely to be confused with those of any of the other members of the genus.

Male. *Length*: 8.2–8.9 mm (\bar{x} = 8.6, n = 3). *Width*: 3.1–3.6 mm (\bar{x} = 3.3, n = 3). *Head*: eyes separated by distance ca. 0.6 x width of rostrum at base. *Rostrum*: length 45–53% (\bar{x} = 49, n = 3) of total body length; distal portion glabrous, length 31–41% (\bar{x} = 35, n = 3) of total rostral length. *Prothorax*: pronotum shallowly impressed posterolaterally; interstriae slightly to markedly convex; punctures with narrow fulvoferruginous scales; pleuron shallowly excavated posterolaterally. *Abdomen*: sternum 5 slightly longer than sternum 4, posterior margin slightly concave. *Legs*: profemur ca. 1.3 x broader than metafemur, ventral tooth with shallow, narrow anterior emargination; metatibia expanded slightly at apex, apical mucro minute. *Genitalia*: aedeagus narrow with dorsal closure medially; endophallus with small, scattered denticles.

Female. *Length*: 8.0–9.8 mm (\bar{x} = 8.9, n = 5). *Width*: 2.9–3.6 mm (\bar{x} = 3.4, n = 5). *Rostrum*: length 57–72% (\bar{x} = 68, n = 5) of total body length; length of distal portion 40–45% (\bar{x} = 43, n = 5) of total rostral length. *Abdomen*: posterior margin of sternum 5 broadly emarginate lateromedially. *Genitalia*: ovipositor long, foretube almost as long as apodeme of eighth sternite; coxites blade-like, bearing minute styli.

Type specimens.— The lectotype of *L. chevrolati* is the specimen Gyllenhal (1836: 393) stated was in the "Musaeo Imperiali Rusico" (Zoological Museum, Academy of Sciences, Leningrad [ZMAS]). Gyllenhal (1836: 393) also stated "descriptus. Rio-Janeiro. Mus. Schh.," apparently in reference to the two specimens mentioned (p. 394) in his "Observ ... Rio-Janeiro communicavit Dom. Westin ..." and by Schönherr (1843: 293). These are apparently the specimens listed above as paralectotypes, now in the Stockholm Museum. Gyllenhal (1836: 394) considered these to differ from the specimen in the Leningrad Museum in their smaller size, shorter, stouter rostrum, and more distal antennal insertion. In fact, one of these

specimens is slightly larger and the other is slightly smaller than the lectotype and the relative length of the rostrum and the position of the antennal insertion is about the same in the lectotype and paralectotype males.

Intraspecific variation.— Two specimens, a male and a female, from Curitiba, Paraná, Brazil, differ slightly from the specimens in the type series. The scales on the elytra of these specimens are slightly more pallid and a little broader and this gives the elytra the appearance of having a slightly more dense vestiture. In addition, the rostrum of the female is shorter (length 57% of total body length) than that in the female paralectotype (length 72% of total body length) and in the other specimens examined (length 69–75% [\bar{x} = 71] of total body length).

Natural history.— The following species of Bombacaceae is a host of *L. chevrolati*:

imbirussú (*Bombax endecaphyllum*): in fruits (Brazil [Bondar 1937: 483, Costa Lima 1943: 119, Costa Lima 1968]).

The only available data about date of collection is for October on a specimen from Curitiba, Brazil.

Distribution.— Specimens of *L. chevrolati* have been collected only in Brazil (Fig. 48). Costa Lima (1943: 119) referred to a male and a female received from Bondar from “Baia”, citing Bondar’s (1937) reference to the species. These are probably among three specimens (2 males, 1 female, IBUS) presently in the Costa Lima collection. These specimens are labelled only “2035,” as are two specimens (1 male, 1 female, AMNH) from Bondar’s own collection. The latter are also labelled “Estado da Bahia.” In addition to the specimens from Bahia and the specimens in the type series, from Rio de Janeiro, specimens from the following localities were examined. **Brazil.** (2 females, ZMBH). *Bahia:* Agua Preta (1 female, DEIC). **Paraná.** Curitiba (1 male, 1 female, DZUP).

The “crushed specimen” (USNM) identified by Pierce (1916: 468) as *L. chevrolati* is a teneral female *L. obliquus*.

Loncophorus pustulatus (Champion)

(Figs. 11, 12, 30, 49, 50)

Loncophorus pustulatus Champion 1903: 153–154. *Holotype*, male, Panamá [Sp. figured.] [♂] [Tolé/Panamá, Champion.] [B.C.A. Col. IV. 4./ *Loncophorus/ pustulatus/* Champ.] [Type] (BMNH). Schenkling and Marshall 1934: 4.

Loncophorus pustulatus (Champion 1903). Pierce 1916: 469. Costa Lima 1943: 120; 1955: 51. Blackwelder 1947: 837. O’Brien and Wibmer 1982: 112.

Loncophorus fluminensis Costa Lima 1943: 121, Fig. 8. *Holotype*: male Brazil [(a blank red square)] [GABINETE DE/ ENTOMOLOGIA/ Esc. Sup. de Agric./ Pinheiro, E. do Rio. N. 2395] [*Loncophorus/ fluminensis/* n.sp. 119431/ Costa Lima det.] [2395”] (IBUS). Costa Lima 1955: 50, 51. Wibmer and O’Brien 1986: 202. New synonymy.

Loncophorus flumensis Costa Lima 1943: 122. Incorrect subsequent spelling of *fluminensis* Costa Lima. Wibmer and O’Brien 1986: 202.

Recognition (Figs. 11, 12).— Specimens of *L. pustulatus* are distinguished by the following combination of characters.

Elytra widest slightly behind humeri, basal portions without scales (Fig. 12); elytral interstria 4 with long prominent discal segment; interstria 5 with short prominent segment adjacent to prominence on interstria 4; frons sulcate; prosternum not extended ventrally in front of procoxae; aedeagus broadly constricted medially, subtruncate apically, without apicolateral prominences (Fig. 30).

The navicular adults are distinguished by the elytral macula which does not cover the basal portions of the elytra (Fig. 12). Adults of the related *L. fusiformis* are distinguished by their more diffuse, more uniformly distributed fasciculate elytral vestiture (cf. Figs. 12, 16). Also, elytral interstria 4 has a discal prominence in adult *L. pustulatus*. These are absent from *L. fusiformis* adults, which have a pustulate discal prominence on interstria 3.

Male. *Length:* 3.6–6.2 mm ($\bar{x} = 5.3$, $n = 19$). *Width:* 1.5–2.6 mm ($\bar{x} = 2.2$, $n = 19$). *Head:* eyes separated by distance ca. 0.5 x width of rostrum at extreme base. *Rostrum:* length 43–54% ($\bar{x} = 47$, $n = 19$) of total body length; constricted at extreme base; distal portion glabrous, length 29–45% ($\bar{x} = 33$, $n = 19$) of total rostral length. *Prothorax:* pronotum shallowly impressed posterolaterally; interstriae slightly to markedly convex; punctures with narrow, pallid fulvous scales; pleuron slightly excavated posterolaterally. *Elytra:* interstriae 2 and 3 slightly prominent in basal 1/8, interstria 4 more markedly prominent distant from base on disc. *Abdomen:* sternum 5 slightly longer than sternum 4, posterior margin straight. *Legs:* profemur ca. 1.3 x broader than metafemur; metatibia expanded apically, apical mucro minute. *Genitalia* (Fig. 30): aedeagus symmetrical, broadly constricted medially, with partial dorsal closure in distal 1/3; endophallus with minute denticles.

Female. *Length:* 4.8–7.4 mm ($\bar{x} = 5.7$, $n = 21$). *Width:* 1.7–2.8 mm ($\bar{x} = 2.3$, $n = 21$). *Rostrum:* length 53–65% ($\bar{x} = 57$, $n = 21$) of total body length; length of distal portion 41–52% ($\bar{x} = 45$, $n = 21$) of total rostral length. *Pygidium:* with broad, rounded, apicodorsal prominence. *Abdomen:* sternum 5 slightly produced medially. *Genitalia:* ovipositor long, foretube almost as long as apodeme of eighth sternite, with slightly sclerotized coxites and small styli.

Intraspecific variation.— Variation among the specimens examined is considerable in size and color. Some of the variation in color appears to be due to the fact that many of the specimens examined are teneral, but this does not explain the dark coloration of the Brazilian specimens and some of the Paraguayan specimens. One Brazilian specimen, reared from flower buds of *Pseudobombax*, is obviously teneral but is also quite dark. The holotype of *L. pustulatus* is relatively small and somewhat teneral. There is also variation in the development of elytral prominences. Costa Lima (1955: 51) cited the presence of elytral prominences as distinguishing *L. fluminensis* from *L. pustulatus*, but the holotypes of the two do not differ significantly in this respect. The holotype of *L. pustulatus*, as well as the other specimens of the species from Central America and northern South America, do

have elytral prominences. However, even though most of the Brazilian and Paraguayan specimens examined have somewhat more developed elytral prominences, this variation is minor compared to that exhibited in the Peruvian specimens examined.

Natural history.— Label data indicate that the following Bombacaceae are hosts of *L. pustulatus*:

ceibo (*Ceiba pentandra*): from “pachos” (Nicaragua);

Pachira aquatica: flower buds (Minas Gerais, Brazil);

Pseudobombax longiflorum: flower buds (Minas Gerais, Brazil).

One adult was removed from a dry, fallen flower bud of *P. longiflorum*, collected 5 km NW Paraopeba, Minas Gerais, Brazil, on 4 September, 1984. A second adult emerged a few weeks later from another bud taken at the same time. Adults were reared from flower buds of *P. aquatica* at Belo Horizonte, Minas Gerais, Brazil, by R. P. Martins. The *Pachira* at Belo Horizonte are ornamentals on the UFMG campus and not native to Minas Gerais.

Specimens have been collected in all months of the year except October and December; 80 per cent of the records are for April through September. They were taken at UV light on Barro Colorado Island, Panamá, and in boll weevil pheromone traps in Paraguay.

Distribution.— Specimens of *L. pustulatus* have been collected in Brazil, El Salvador, México, Nicaragua, Panamá, Paraguay, Peru and Venezuela (Figs. 49, 50). In addition to the holotypes of *L. pustulatus* and *L. fluminensis*, these were from the following localities. **Brazil**. *Goiás*: Jataí (1 female, DEIC). *Minas Gerais*: Belo Horizonte (3 males, 3 females, MZSP); Lombary (1 male, USNM); 5 km N. Paraopeba (1 female, AUEM). *Paraná*: São João do Juai (1 female, DZUP). *São Paulo*: Cororrel Macedo (1 male, AUEM); Fazenda Pão d’Alho, Itú (1 male, MZSP); Peruibe (1 female, MZSP). **El Salvador**. *Santa Ana*: 6 km W Hwy. CA 1, above Lago de Coatepeque (1 female, USNM). **México**. *Veracruz*: Coyame (Catemaco) (1 male, USNM). **Nicaragua**. Dos Montes, Entrada al Sauce (2 females, USNM). **Panamá**. *Canal Zone*: Barro Colorado Island (1 female, USNM; 3 males, 2 females, CWOB). **Paraguay**. (6 males, 3 females, ZMHB); Capitán Bado (1 male, 7 females, CWOB). **Peru**. *Cajamarca*: entre Chamaya y Jaen (Valle de Marañon) (2 females, NZAC). *Lima*: entre Huacho y Sayán, (Valle Huaura) (1 female, NZAC). *Puno*: Pucará (2 females, NZAC). **Venezuela**. *Aragua*: El Limón (1 male, 1 female, IZAV); Maracay (1 male, 3 females, NZAC); Rancho Grande (1 male, IZAV). *Bolívar*: El Pao (1 female, IZAV). *Zulia*: El Tucuco (1 female, IZAV).

Loncophorus crossi, new species

(Figs. 13, 14, 31, 49)

Type series.— *Holotype*: male, México [MEXICO: Oaxaca/ 2.1 mi. nw. Totolapan/ August 7, 1980/ Schaffner and/ Friedlander] (USNM). *Paratypes*: México, 2 females [MEXICO: Oaxaca/ 2.1 mi. nw. Totolapan/ July 11-17, 1981/ Bogar, Schaffner./ Friedlander]; total paratypes, 2 (AUEM, TAMU).

Recognition (Figs. 13, 14).— Specimens of *L. crossi* are distinguished by the following combination of characters.

Elytra widest at humeri, basal portions with large scales (Fig. 14); elytral interstria 4 with long prominent discal segment; interstria 5 with short prominent segment adjacent to prominence of interstria 4; frons sulcate; prosternum not extended ventrally in front of procoxae; aedeagus broadly constricted medially, subtruncate apically, with apicolateral prominences (Fig. 31).

They are distinguished from specimens of the closely related *L. pustulatus* by the somewhat larger size and stouter, more robust body form (*cf.* Figs. 11-14). In addition, the basal portions of elytral interstriae 4-6 in *L. crossi* have large scales like those on the discal macula (Fig. 14). The corresponding portions of the elytra of *L. pustulatus* lack such scales (Fig. 12). The apex of the aedeagus of *L. crossi* has apicolateral prominences which are absent from *L. pustulatus* (*cf.* Figs. 30, 31).

Male. *Length:* 5.8 mm ($n = 1$). *Width:* 2.5 mm ($n = 1$). *Head:* eyes separated by distance ca. 0.5 x width of rostrum at base. *Rostrum:* length 43% ($n = 1$) of total body length, not constricted at extreme base; distal portion glabrous, length of distal portion 29% ($n = 1$) of total rostral length. *Prothorax:* pronotum shallowly impressed posterolaterally; interstriae smooth, slightly to markedly convex to pustulate; punctures with narrow fulvoferruginous scales; pleuron deeply excavated posterolaterally. *Elytra:* interstria 3 slightly prominent in basal 1/8. interstria 4 more prominent distant from base on disc. *Abdomen:* sternum 5 slightly longer than sternum 4, posterior margin produced medially. *Legs:* profemur ca. 1.4 x broader than metafemur; metatibia expanded apically, apical mucro minute. *Genitalia* (Fig. 31): aedeagus symmetrical, broadly constricted medially, with small dorsal closure in distal 1/3; endophallus with small spines.

Female. *Length:* 6.4-6.8 mm ($n = 2$). *Width:* 2.7-3.0 mm ($n = 2$). *Rostrum:* length 52% ($n = 2$) of total body length; length of distal portion 39-43% ($n = 2$) of total rostral length. *Pygidium:* with broad, rounded, apicodorsal prominence. *Abdomen:* sternum 5 slightly produced medially. *Genitalia:* ovipositor not elongate, foretube less than 0.5 x length of apodeme of eighth sternite, with slightly sclerotized coxites and small styli.

Etymology.— This species is named in honor of William Henry Cross (1928-1984) in memory of his contributions to the knowledge of ecology and systematics of the anthonomine weevils.

Natural history.— Plant associations of *L. crossi* are unknown. The general resemblance of adults of the species to those of *L. pustulatus*, however, would suggest that larvae similarly develop in flower buds of Bombacaceae. The specimens in the type series were collected in July and August.

Distribution.— The types from the state of Oaxaca, México (Fig. 49) are the only known specimens of *L. crossi*.

Loncophorus fusiformis (Champion)

(Figs. 15, 16, 32, 45, 49, 50)

Loncophorus fusiformis Champion 1903: 153. *Lectotype* (here designated): male, México [PLAYA VICENTE] [392] [Mexico./ Sallé Coll.] [♂] [B.C.A. Col. IV. 4./ *Loncophorus/ fusiformis./ Champ.*] [Type] (BMNH). *Paralectotypes*: Guatemala, 2 males, 1 female, [Pantaleon./ 1700 ft./ Champion.] [B.C.A. Col. IV. 4./ *Loncophorus/ fusiformis./ Champ.*] (BMNH); (1 male, 1 female, [sp. figured.] [Mirandilla, 1700 ft./ Champion.] [♂♀] [B.C.A. Col. IV. 4./ *Loncophorus/ fusiformis./ Champ.*] (BMNH); 2 males, 4 females, [Mirandilla/ 1700 ft./ Champion.] [B.C.A. Col. IV. 4./ *Loncophorus/ fusiformis./ Champ.*] (BMNH). México, 1 female [Cerro de Plumas./ Mexico./ Hoege.] [B.C.A. Col. IV. 4./ *Loncophorus/ fusiformis./ Champ.*] (BMNH). Panamá, 1 male [V. de Chiriqui/ below 4,000 ft./ Champion./] [B.C.A. Col. IV. 4./ *Loncophorus/ fusiformis./ Champ.*]. Schenkling and Marshall 1934:4.

Loncophorus fusiformis (Champion (1903)). Pierce 1916: 469. Costa Lima 1943: 120; 1955: 51. Blackwelder 1947: 837. Burke 1968: 28. Ahmad and Burke 1972: 43. Wibmer and O'Brien 1986: 202.

Atractomerus fusiformis (Champion). Voss 1944: 41. O'Brien and Wibmer 1982: 112.

Recognition (Figs. 15, 16).— Specimens of *L. fusiformis* are distinguished by the following combination of characters.

Elytra widest slightly behind humeri (Fig. 16); prothorax with well-developed postocular lobes; elytral interstriae with slightly but distinctly contrasting elevated and depressed portions, scales forming diffuse maculae (Fig. 16); elytral interstria 5 with discal pustule; prosternum not extended ventrally in front of procoxae; pygidium of male with low median, longitudinal, apicodorsal carina; pygidium of female constricted subapically, with transverse, subapical impression (Fig. 45); elytra without dark, transverse, posterolateral integumentary maculae.

Male. *Length*: 6–5.7–7.2 mm (\bar{x} = 6.4, n = 15). *Width*: 2.4–2.9 mm (\bar{x} = 2.6, n = 15). *Head*: eyes separated by distance ca. 0.6 x width of rostrum at base. *Rostrum*: length 50–56% (\bar{x} = 53, n = 15) of total body length; distal portion glabrous, length 27–34% (\bar{x} = 30, n = 15) of total rostral length. *Prothorax*: pronotum not impressed posterolaterally; interstriae convex; punctures with narrow, white or fulvous scales, latter dense on dorsal midline; pleuron not excavated posterolaterally. *Abdomen*: sternum 5 distinctly longer than sternum 4, posterior margin straight. *Legs*: profemur ca. 1.2 x broader than metafemur; metatibia slightly narrowed apically, apical mucro minute. *Genitalia* (Fig. 32): aedeagus symmetrical, without dorsal closure.

Female. *Length*: 5.8–7.2 mm (\bar{x} = 6.5, n = 15). *Width*: 2.4–3.0 mm (\bar{x} = 2.6, n = 15). *Rostrum*: length 65–73% (\bar{x} = 69, n = 15) of total body length; length of distal portion 44–52% (\bar{x} = 48, n = 15) of total rostral length. *Abdomen*: sternum 5 slightly produced medially. *Genitalia*: ovipositor long, foretube almost as long as apodeme of eighth sternite; coxites slightly sclerotized, bearing small styli.

Type specimens.— Champion (1903: 153) stated that he based the original description of *L. fusiformis* on 18 specimens from Playa Vicente and Cerro de

Plumas, México, Pantaleón and Mirandilla, Guatemala, and Bugaba and Volcán de Chiriquí, Panamá. Fifteen specimens from the British Museum (BMNH) were examined. Not among these were the specimens from Bugaba and Volcán de Chiriquí, Panamá. Presumably a specimen in Berlin (ZMBH) labelled [Volcan de Chiriquí] [Champion] is one of these syntypes.

Natural history.— Label data and published reports indicate that the following species of Bombacaceae is a host of *L. fusiformis*:

Ceiba: flower bud (El Salvador [Burke 1968]), “in seeds” (probably in error) (El Salvador [Ahmad and Burke 1972, Burke 1968]).

Ahmad and Burke (1972: 43) and Burke (1968: 29) stated that the larvae and pupae they described were identified by association with adults labelled “‘In seeds’ of ‘Ceiba’ from Alf. Gallegos, S. Salvador, CA. 37.2060.” These specimens (USNM) are pinned with a flower bud (not a seed). Burke (1968: 29) also stated that a pupa came from a flower bud of *Ceiba*. It seems likely that larvae of the species develop in the flower buds of *Ceiba pentandra*.

Specimens of *L. fusiformis* have been collected during all months of the year except August; 71 per cent of the records are for December through April. Adults were collected in UV light traps on Barro Colorado Island, Panamá.

Distribution.— Specimens of *L. fusiformis* have been collected in Brazil, Colombia, El Salvador, Guatemala, México, Panamá, Peru, Trinidad and Venezuela (Fig. 49, 50). In addition to the localities from which the specimens in the type series were collected, specimens from the following were examined. **Brazil**. (1 female, BMNH). **Colombia**. *Antioquia*: Chigorodo, Rio León (1 male, CWOB). **El Salvador**. *San Salvador*: San Salvador (2 males, USNM). *Santa Ana*: El Chilamatal, S. Calderón (1 male, 2 females, USNM). **Guatemala**. (1 female, BMNH). *Sacatepéquez*: (1 male, USNM). **México**. (1 male, ZMHB). **Panamá**. “XX Plantation” (1 female, USNM). *Canal Zone*: Barro Colorado Island (17 males, 26 females, CWOB; 20 males, 12 females, USNM); Margarita (1 male, HAH). *Chiriquí*: Volcán de Chiriquí (1 male, ZMHB). **Peru**. *Madre de Dios*: Rio Tambopata Res., 30 km. (air) SW Puerto Maldonado (1 male, USNM). **Trinidad**. (1 male, BMNH); Arima Valley (1 female AMNH). **Venezuela**. *Barinas*: Barinitas (1 female, IZAV); La Soledad (1 male, IZAV). *Bolívar*: Las Nieves (1 female, IZAV). *Mérida*: La Azulita (1 female, CCBM). Wibmer and O’Brien (1986: 202) listed Surinam as part of the distribution of *L. fusiformis*, but specimens on which this record is based were not examined.

Loncophorus costalimai new species

(Figs. 17, 18, 33, 52)

Type Series.— *Holotype*: male, Brazil, [BRASIL, Mato Grosso/ Sinop (12°31’S/55°37’W) X-1974/ M. Alvarenga] (DZUP). *Paratypes*: Brazil, 1 female [BRASIL, Mato Grosso/ Sinop (12°31’S/ 55°37’W) X-1974/ M. Alvarenga]; 6 males, 6 females [BRASIL, Mato Grosso/ Sinop (12°31’S/ 55°37’W) X-1974/ M. Alvarenga]; total paratypes, 13 (AUEM, CWOB, TAMU).

Recognition (Figs. 17, 18).— Specimens of *L. costalimai* are distinguished by the following combination of characters.

Elytra with sides slightly convergent behind humeri, with dark, posteromedian, transverse integumentary macula (Fig. 18); elytral scales in diffuse fascicles, not forming discrete maculae, dense on declivities (Fig. 18); elytral interstria 5 with discal pustule; prosternum not extended ventrally in front procoxae; pygidium of male with low longitudinal, median, apicodorsal carina.

Adults might be mistaken for those of some species of *Anthonomus* because the prothoracic postocular lobes are only slightly developed and the elytra are not navicular in form and do not have distinctly contrasting elevated and depressed portions. In these characters specimens of *L. costalimai* differ from those of the closely related *L. fusiformis*, which also have a small discal pustule on elytral interstria 5 and a longitudinal carina on the male pygidium.

Male. *Length:* 4.2–4.7 mm (\bar{x} = 4.5, n = 7). *Width:* 2.0–2.1 mm (\bar{x} = 2.0, n = 7). *Head:* eyes separated by distance ca. 0.6 x width of rostrum at base. *Rostrum:* length 1.0–1.1% (\bar{x} = 1.0, n = 7) of total body length; distal portion glabrous, length 34–38% (\bar{x} = 36, n = 7) of total rostral length. *Prothorax:* pronotum not impressed posterolaterally; interstriae slightly convex; punctures with narrow fulvous scales; pleuron not excavated posterolaterally. *Abdomen:* sterna 4 and 5 subequal in length, 5 with apicolateral clusters of long setiform scales, posterior margin straight. *Legs:* profemur ca. 1.3 x broader than metafemur; metatibia not narrowed apically, apical mucro short, perpendicular. *Genitalia* (Fig. 33): aedeagus symmetrical, with partial dorsal closure in distal 1/3; endophallus minutely denticulate.

Female. *Length:* 4.4–4.8 mm (\bar{x} = 4.6, n = 5). *Width:* 2.0–2.1 mm (\bar{x} = 2.1, n = 5). *Rostrum:* length 1.2–1.3% (\bar{x} = 1.2, n = 5) of total body length; length of distal portion 44–48% (\bar{x} = 46, n = 5) of total rostral length. *Abdomen:* sternum 5 slightly produced medially. *Genitalia:* ovipositor long, foretube almost as long as apodeme of eighth sternite; coxites slightly sclerotized, bearing small styli.

Etymology.— This species is named in honor of Angelo M. da Costa Lima (1887–1964) commemorating his contributions to the knowledge of the genus *Loncophorus*.

Natural history.— Plant associations of *L. costalimai* are unknown, but the relatively small size of the adults would seem to indicate that larvae of the species develop in flower buds, probably of Bombacaceae. The specimens in the type series were collected in October.

Distribution.— The types from the state of Mato Grosso, Brazil (Fig. 52) are the only specimens of *L. costalimai* known.

Loncophorus martinsi, new species

(Figs. 19, 20, 34, 40, 46)

Type series.— *Holotype:* male **Brazil** [Faz. Floresta, Mun./ Três Lagoas, MT./ 13–20.IX.1964/ Exp. Depto. Zool.] (MZSP). *Paratypes:* Brazil, 1 female [Santarém/

PA, Brasil/ 27–28.XII.1967/ Exp. Perm. Amaz.]; 1 female [Brazil: São Paulo/ Faz. Campininha/ Mun. Mogi-Guaçu/ R.P. Martins 2Jun'78] [Taken on/ *Eriothea/ gracilipes*]; 1 male [BRASIL, Goiás/ Jataí XI-1972/ F.M. Oliveira]; 6 males, 5 females [BRAZIL: M.G./ Diamantina/ 5 Sept. 1984/ Clark & Martins] [Reared from/ flower bud/ *Eriothea/ sp.*]. French Guiana, 1 male [FR. GUIANA: Hwy. ext./ NI, 20 km se of St./ Laurent, 7–VI-1986/ E.G. Riley & D.A. Rider] [collected at/ mercury vapor]. Paraguay, 1 female [PARAGUAY: Dept. Concepcion/ Yhy Yau/ W.H. Whitcomb & R.M. Marengo/ boll weevil pheromone/ trap #E33–8]; total paratypes, 15 (AUEM, CWOB, FSCA, MZSP).

Recognition (Figs. 19, 20).—Specimens of *L. martinsi* are distinguished by the following combination of characters.

Elytra subparallel-sided (Fig. 20); elytral interstria 3 slightly curved, with dense, pallid, elongate scales; prothorax punctate, with complete, narrow dorsomedian vitta of pallid scales; elytra with dark, round posterolateral integumentary maculae (Fig. 19, 20); metatibia of male constricted subapically (cf. Fig. 41); mesotrochanters of male prominent (Fig. 40); pygidium of male rounded with small apicomedian emargination; elytral interstria 5 with small discal pustule; pygidium of female with narrow apicodorsal prominence (Fig. 46).

The small discal pustule on elytral interstria 5 is like that in specimens of *L. costalimai* and *L. fusiformis*. Nevertheless, specimens of *L. martinsi* are easily distinguished from specimens of both of these species by the dense pallid scales on the third elytral interstria, prominent male mesotrochanters and subapically constricted male metatibia. From specimens of the similarly non-navicular *L. costalimai*, specimens of *L. martinsi* are additionally distinguished by absence of a male pygidial carina. They are further distinguished from specimens of *L. fusiformis* by the smaller size and non-navicular form.

Male. *Length:* 3.9–4.8 mm (\bar{x} = 4.3, n = 8). *Width:* 1.6–2.0 mm (\bar{x} = 1.8, n = 8). *Head:* eyes separated by distance ca. 0.7 x width of rostrum at base. *Rostrum:* length 45–52% (\bar{x} = 50, n = 8) of total body length, markedly, evenly curved; with sparse scales at base; length of distal portion 36–41% (\bar{x} = 39, n = 8) of total rostral length. *Prothorax:* with long, whitish to pallid fulvous scales broader and more dense on dorsal midline; pleuron not excavated posterolaterally. *Elytra:* interstriae 4–6 slightly depressed at base; interstriae 2–6 narrow basally, gradually widened posteriorly. *Legs:* protibia with large, obtuse, subangulate midventral prominence. *Genitalia:* (Fig. 34): aedeagus symmetrical, without dorsal closure, apically acute; endophallus with scattered denticles.

Female. *Length:* 4.0–5.0 mm (\bar{x} = 4.6, n = 6). *Width:* 1.7–2.1 mm (\bar{x} = 1.9, n = 6). *Rostrum:* Length 54–62% (\bar{x} = 59, n = 6) of total body length; length of distal portion 45–54% (\bar{x} = 49, n = 6) of total rostral length.

Etymology.— I take pleasure in naming this species in honor of a friend and colleague, Rogério Parentoni Martins of Belo Horizonte, Minas Gerais, Brazil.

Natural history.— The following species of Bombacaceae is a host of *L. martinsi*:

Eriotheca sp.: reared from flower buds (Diamantina, Minas Gerais, Brazil).

Specimens have been collected in June, September, November and December. One specimen was taken in a mercury vapor trap.

Distribution.— The types from Brazil, French Guiana and Paraguay (Fig. 52) are the only known specimens of *L. martinsi*.

Loncophorus santarosae (Clark) new combination
(Figs. 21, 22, 35, 41, 51)

Anthonomus santarosae Clark 1986: 320–325. *Holotype*: male, Costa Rica, male [83–SRNP.37] [Santa Rosa National Park/ Guanacaste Province/ Costa Rica, D.H. Janzen] (USNM).

Recognition (Figs. 21, 22).— Specimens of *L. santarosae* are distinguished by the following combination of characters.

Elytra narrower at base than posteriorly (Fig. 22); elytral interstria 3 slightly curved, elevated, with dense, pallid, elongate scales on basal 1/3 (Fig. 22); mesotrochanters of male prominent (*cf.* Fig. 40); prothorax with narrow middorsal vitta of pallid scales, without posterolateral scales (Figs. 21, 22); elytral interstriae flat to slightly convex, with sparse to dense and subfasciculate scales; metatibia of male constricted subapically (Fig. 41); elytral interstria 5 with smooth, shining, elongate elevation slightly posterior to base; pygidium of male rounded, with small apicomedian emargination; pygidium of female with broad apicodorsal prominence.

Adults of this species are quite distinct from all of the other species of *Loncophorus* except for those of *L. myrmecodes*. They are distinguished from specimens of *L. myrmecodes* by the characters listed in the section on recognition of that species.

Male. See Clark and Burke (1986a).

Female. See Clark and Burke (1986a).

Intraspecific variation.— This species was described from specimens from Costa Rica, Panamá and Venezuela. As indicated by Clark (1986: 325), the Panamanian paratypes of *A. santarosae* differ from the Costa Rican and Venezuelan ones in the darker coloration of the integument, the smaller, sparser pronotal and elytral punctures, smoother, more nearly flat elytral interstriae, and the sparser vestiture (*cf.* Clark and Burke [1986a: Figs. 1, 2] and Figs. 21, 22). These differences complicate diagnosis of *A. santarosae* since they make the Panamanian specimens superficially similar to *A. myrmecodes* (*cf.* Figs. 21–24). The elytral vestiture in the Costa Rican and Venezuelan specimens consists of relatively dense multiple rows of elongate

scales on major portions of the elytra (Clark and Burke 1986a: Figs. 1, 2). In the Panamanian specimens, except for the basal portion of interstria 3, the vestiture consists only of sparse, uniformly distributed elongate scales which leave the relatively smooth, shining, black integument more broadly exposed (Figs. 21, 22).

Natural history.— Larvae of *L. santarosae* develop in flower buds of *Bombacopsis quinata* (Jacq.) Dugand (Bombacaceae). Larvae, pupae and adults were collected at the type locality during the month of February. Additional adults were collected in January, March, April and December. They were collected at UV light traps in Panamá (Clark and Burke 1986a).

Distribution.— The specimens of *L. santarosae* in the type series from Costa Rica, Panama and Venezuela (Fig. 51) were the only specimens examined.

Loncophorus myrmecodes, new species

(Figs. 23, 24, 36, 42, 51)

Type Series.— *Holotype*: male, Panamá [PANAMA, Pan./ Cerro Campana/ 16 July 1976/ Wayne E. Clark] (USNM). *Paratypes*: Panamá, 3 females [PANAMA, Pan./ Cerro Campana/ 16 July 1976/ Wayne E. Clark]; 1 male [Panamá: Panamá Pr./ Cerro Campana, 850 M/ 8°40'N, 79°56'W] [26.vi.1977/ H.A. Hespénheide]; total paratypes, 4 (CHAH, USNM).

Recognition (Figs. 23, 24).— Specimens of *L. myrmecodes* are distinguished by the following combination of characters:

Elytra narrow at base, inflated posteriorly (Fig. 24); prothorax narrow, smooth, obsoletely punctate, with narrow dorsomedian vitta and posterolateral patch of white scale (Figs. 23, 24); elytral interstriae flat, smooth, glabrous, except for dense white scales on basal portion of interstria 3 and around apices (Fig. 24); abdominal sternum 5 of male with dense, long, curved, suberect setiform scales; metatibia of male narrowed apically (Fig. 42); abdominal sternum 5 of male broadly emarginate on posterior margin; pygidium of male truncate apically, without apicomedian emargination.

This species is described from specimens found among specimens of *Anthonomus aterrimus* Champion, *A. funereus* Champion and *A. otidocephaloides* Champion. All of these are similar to specimens of *L. myrmecodes* in the relatively elongate, convex, sparsely punctate, shining, glabrous or nearly glabrous pronotum and elytra. Sleeper (1958) and Clark (1988) noted that in these characters these and several other *Anthonomus* superficially resemble members of the curculionid subfamily Otidocephalinae. Adults of *L. myrmecodes* differ from adults of these and other, related species of *Anthonomus* by the white scales on the basal portion of elytral interstria 3, by the subtrapezoidal, prominent male mesotrochanters, and by the inflated profemur and large, deeply emarginate profemoral tooth. The divergence of *L. myrmecodes* from what has previously been considered to be the typical

Loncophorus form toward the otidocephaline form goes beyond that exhibited by the related *L. santarosae*. In fact, some of the characters by which *L. myrmecodes* is distinguished from *L. santarosae* are those which make *L. myrmecodes* more otidocephaline-like (i.e., the narrower pronotum, the elytra narrower at the base and more inflated posteriorly, the shallower, sparser punctation and vestiture on the prothorax and elytra which expose extensive smooth, shining, glabrous integument). In addition, adult *L. myrmecodes* differ from adult *L. santarosae* in having the male metatibia narrowed, rather than constricted apically (cf. Figs. 41, 42), sternum 5 of the male abdomen broadly emarginate posteriorly, and the male pygidium truncate apically and without an apicomedian emargination.

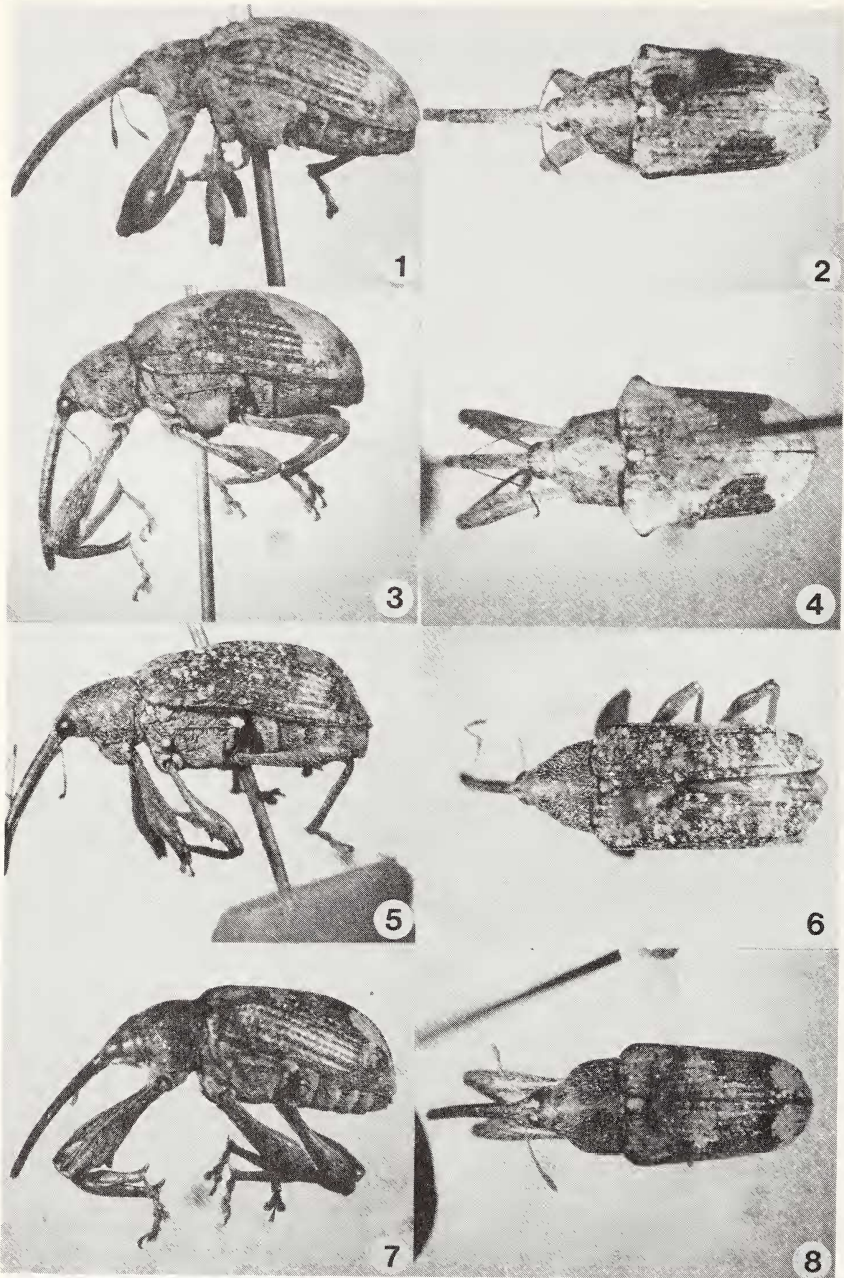
Male. *Length:* 3.8–4.0 ($n = 2$) mm. *Width:* 1.6–1.7 ($n = 2$) mm. *Head:* vertex smooth, glabrous; venter with broad white scales; eyes large, round, evenly convex, separated by distance ca. 0.7 x width of rostrum at base. *Rostrum:* length 41–42% ($n = 2$) total body length; evenly curved; length of distal portion 32–34% ($n = 2$) of total rostral length; lateral sulcus with setiform white scales. *Prothorax:* with posterolateral depression. *Elytra:* interstriae of uniform width; striae shallowly punctate, obsolete posteriorly. *Pygidium:* punctate, with long setiform scales. *Legs:* protibia straight on dorsal margin, ventral margin with large, obtuse, median prominence; apical mucro long, slender. *Genitalia* (Fig. 36): aedeagus with sides gradually widened from base then markedly narrowed to apicomedian projection; endophallus with small, dense denticles.

Female. *Length:* 3.8–4.6 ($\bar{x} = 4.2$, $n = 3$) mm. *Width:* 1.8–2.4 ($\bar{x} = 2.0$, $n = 3$) mm. *Rostrum:* length 44–48% ($\bar{x} = 46$, $n = 3$) total body length, broadly, evenly curved; length of distal portion 37–39% ($\bar{x} = 38$, $n = 3$) of total rostral length. *Pygidium:* with slight, subangulate, apicomedian prominence. *Abdomen:* sternum 5 narrowed and slightly prominent apicomediaally.

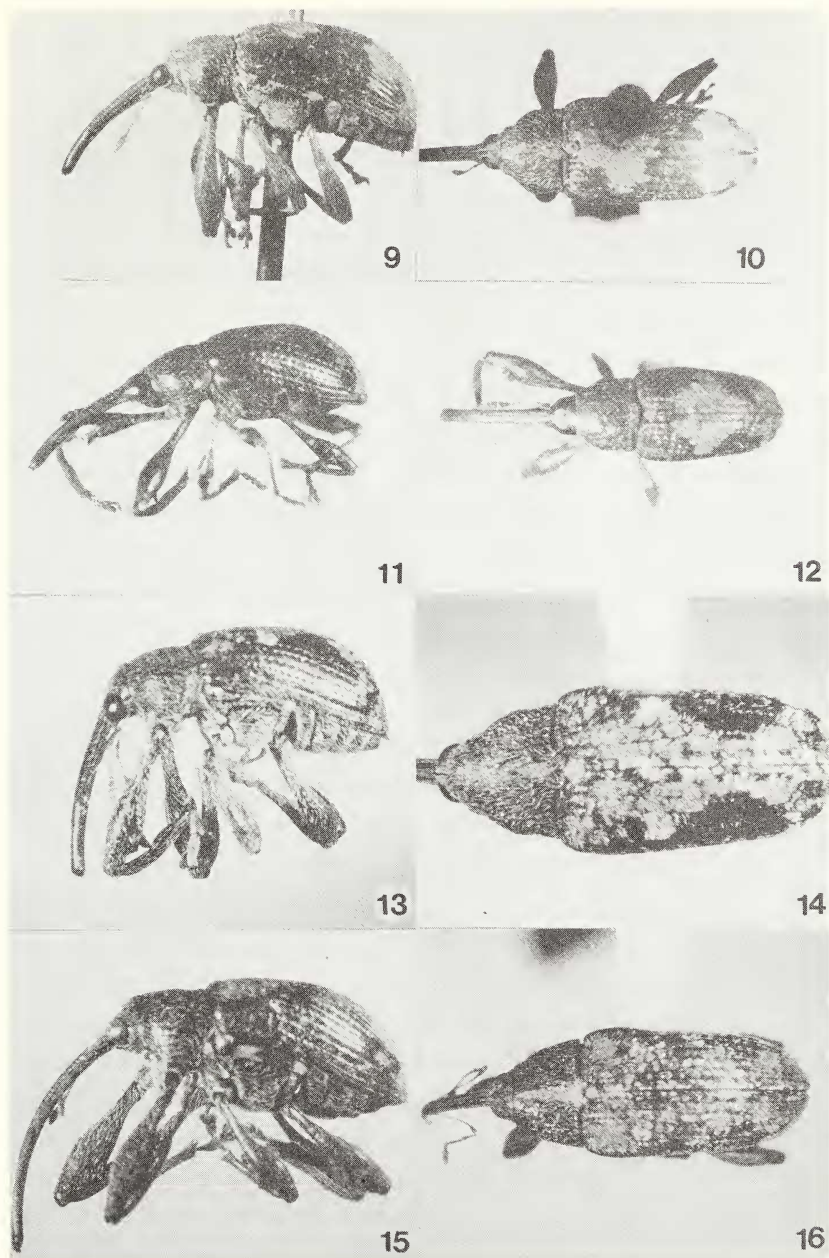
Etymology.— The name of this species means like a *Myrmex*. It refers to the superficial resemblance of the species to Curculionidae of the genus *Myrmex* (Otidocephalinae).

Natural history.— The plant associations of *L. myrmecodes* are unknown, but the adult size and form are very close to that of *L. santarosae* and suggest that larvae of the species will be found, like those of that species, to develop in flower buds of Bombacaceae. Specimens have been collected in June and July.

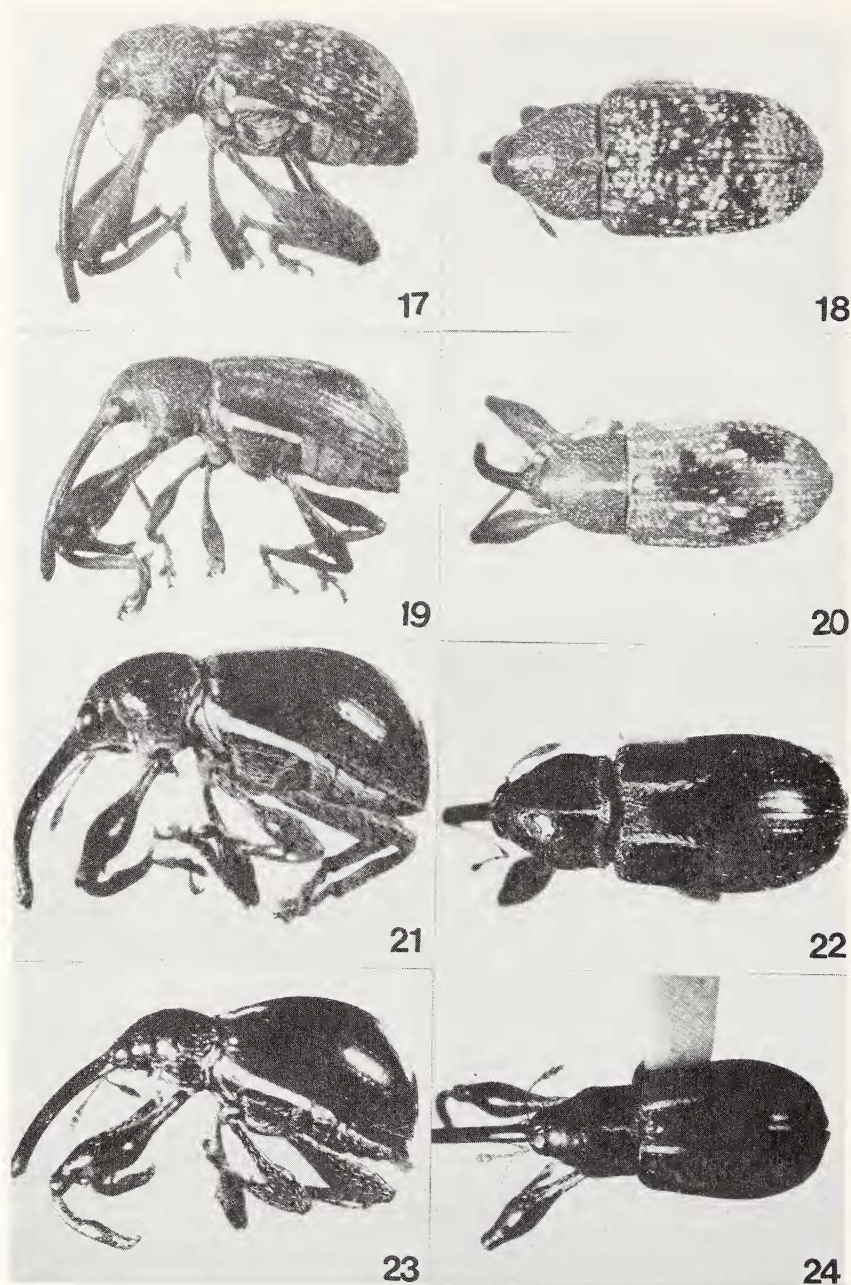
Distribution.— The specimens of *L. myrmecodes* in the type series from Panamá (Fig. 51) were the only ones examined.



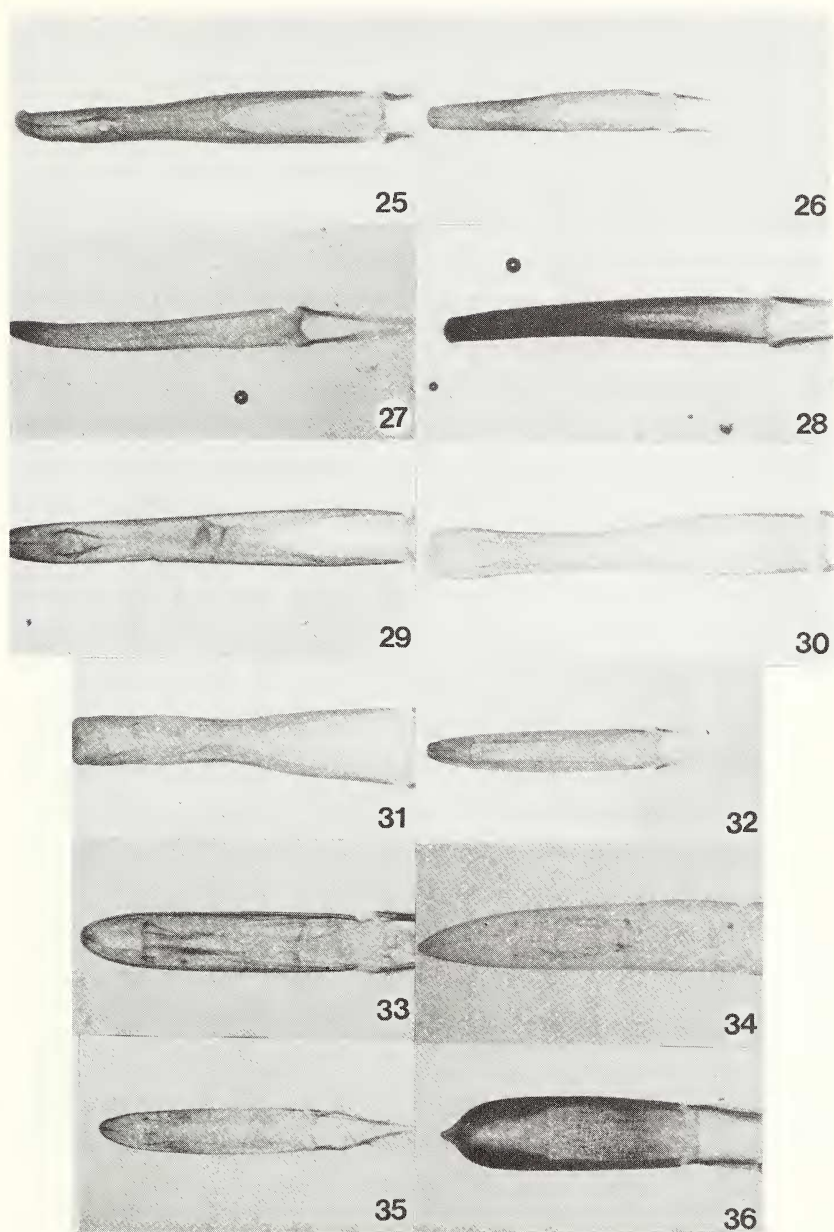
Figures 1-8. Habitus, dorsal and lateral views: 1) *L. obliquus*, male lectotype; 2) *L. obliquus*, male lectotype; 3) *L. daviesii*, male lectotype (of *L. petiminosus*); 4) *L. daviesii*, male lectotype (of *L. petiminosus*); 5) *L. varius*, male holotype; 6) *L. varius*, male holotype; 7) *L. fortis*, female lectotype; 8) *L. fortis*, female lectotype.



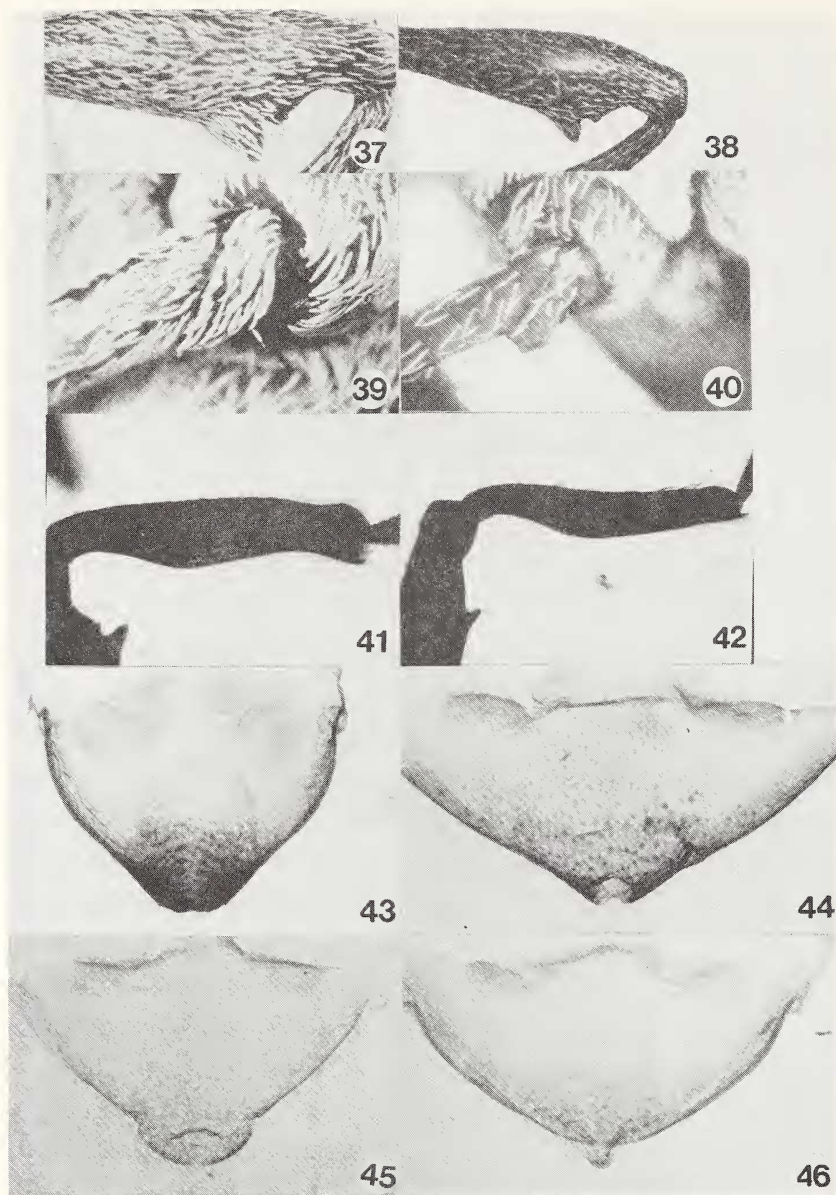
Figures 9–16. Habitus, dorsal and lateral views: 9) *L. chevrolati*, male lectotype; 10) *L. chevrolati*, male lectotype; 11) *L. pustulatus*, male holotype; 12) *L. pustulatus*, male holotype; 13) *L. crossi*, female paratype; 14) *L. crossi*, female paratype; 15) *L. fusiformis*, female paralectotype, Cerro de Plumas, México; 16) *L. fusiformis*, female paralectotype, Cerro de Plumas, México.



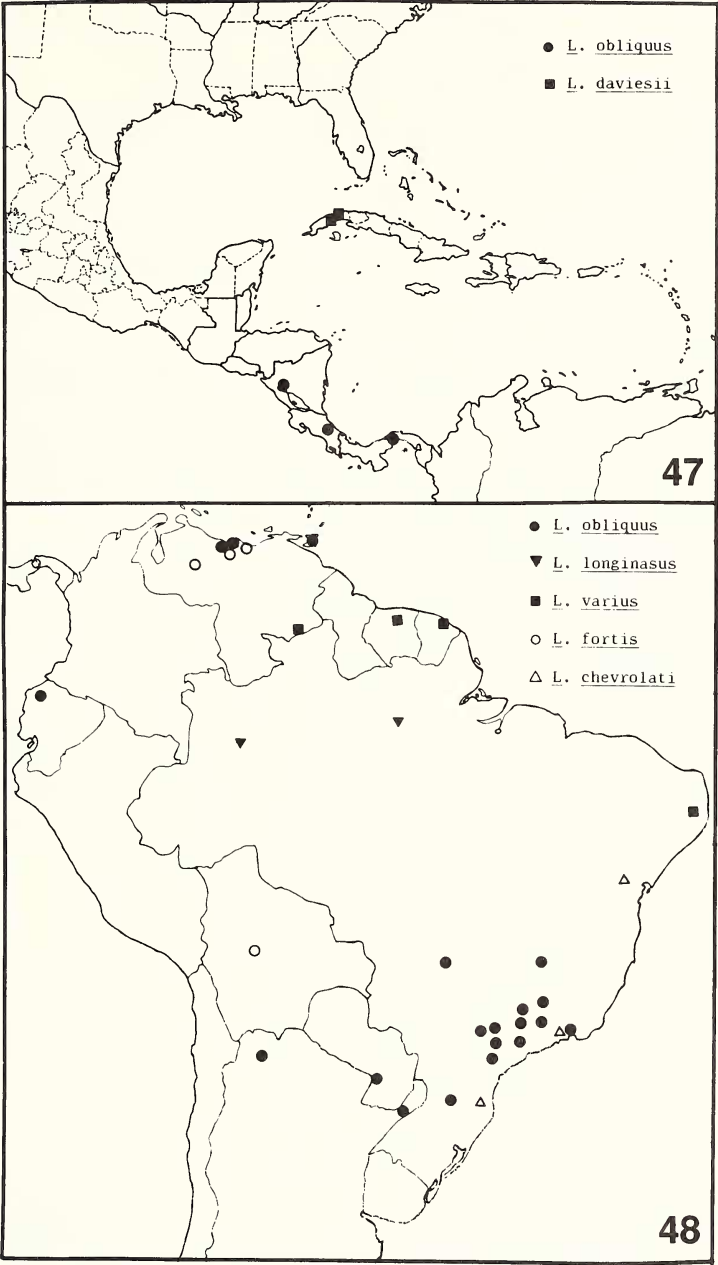
Figures 17-24. Habitus, dorsal and lateral views: 17) *L. costalimai*, female paratype; 18) *L. costalimai*, female paratype; 19) *L. martinsi*, male paratype, Diamantina, Minas Gerais, Brazil; 20) *L. martinsi*, male paratype, Diamantina, Minas Gerais, Brazil; 21) *L. santarosae*, female paratype, Barro Colorado Island, Panamá; 22) *L. santarosae*, female paratype, Barro Colorado Island, Panamá; 23) *L. myrmecodes*, female paratype, Cerro Campana, Panamá; 24) *L. myrmecodes*, female paratype, Cerro Campana, Panamá.



Figures 25–36. Aedeagus, dorsal view: 25) *L. obliquus*, 5 km. NW Paraopeba, Minas Gerais, Brazil; 26) *L. daviesii*, (lectotype of *L. petiminosus*; 27) *L. longinasus*, Obidos, Pará, Brazil; 28) *L. varius*, holotype; 29) *L. chevrolati*, paralectotype; 30) *L. pustulatus*, holotype; 31) *L. crossi*, holotype; 32) *L. fusiformis*, lectotype; 33) *L. costalimai*, holotype; 34) *L. martinsi*, holotype; 34) *L. santarosae*, holotype; 35) *L. santarosae*, holotype, 36) *L. myrmecodes*, holotype.



Figures 37–38. Profemur of male, anterior views: 37) *L. obliquus*, profemur of specimen from 5 km NW Paraopeba, Minas Gerais, Brazil; 38) *L. varius*, profemur of holotype. Figures 39–40. Mesotrochanter of male, anterior views: 39) *L. obliquus*, 5 km NW Paraopeba, Minas Gerais, Brazil; 40) *S. martinsi*, holotype. Figures 41–42. Metatibia of male. 41) *L. santarosae*, holotype; 42) *L. myrmecodes*, holotype. Figures 43–46. Pygidium of female, dorsal views: 43) *L. obliquus*, (paralectotype of *L. ecuadorius*); 44) *L. fortis*, lectotype; 45) *L. fusiformis* female paralectotype, Cerro de Plumas, México; 46) *L. martinsi*, paratype, Fazenda Campininha, Mogi-Guaçu, São Paulo, Brazil.



Figures 47. Distributions of *L. obliquus* and *L. daviesii*. Figure 48. Distributions of *L. obliquus*, *L. longinasus*, *L. varius*, *L. fortis* and *L. chevrolati*.

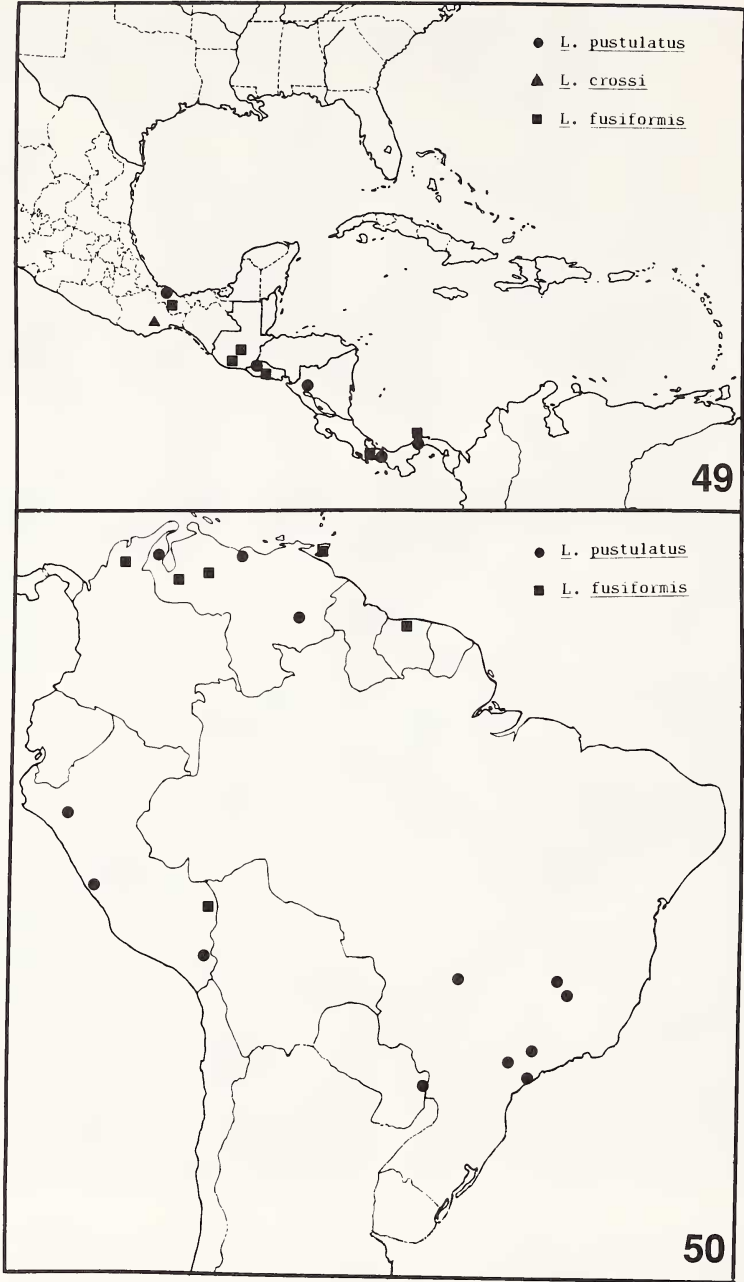


Figure 49. Distributions of *L. pustulatus*, *L. crossi* and *L. fusiformis*. Figure 50. Distributions of *L. pustulatus* and *L. fusiformis*.

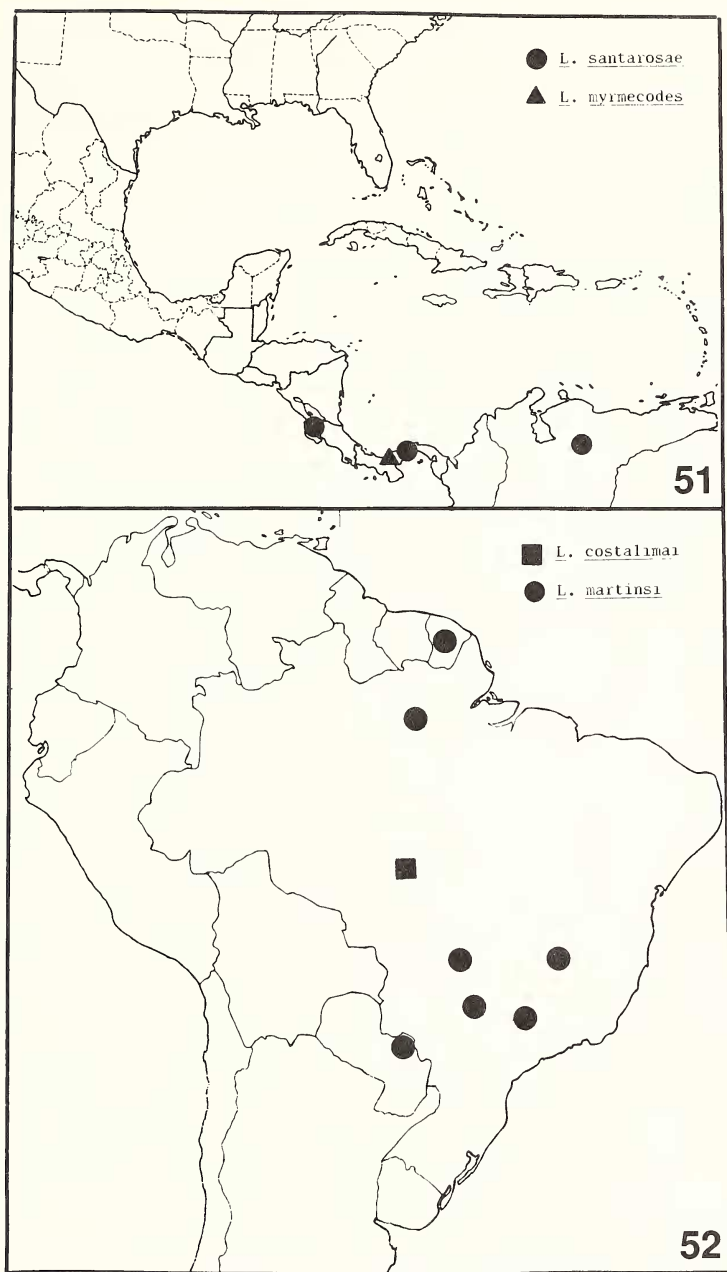


Figure 51. Distributions of *L. santarosae* and *L. myrmecodes*. Figure 52. Distributions of *L. costalimai* and *L. martinsi*.

PHYLOGENY

Phylogenetic relationships of the species of *Loncophorus* were determined by comparing the distribution of morphological characters of the adult stage of each of the species. Twenty-four of these characters, discussed in detail below, were determined to be apomorphic by comparison of the species of *Loncophorus* with a hypothetical ancestral taxon. This taxon, or outgroup, was conceptualized after examination of numerous anthonomines, including, but not limited to, the members of the *albolineatus*, *furcatus*, *grandis*, *gularis*, *unipustulatus* and *venustus* groups of the genus *Anthonomus*, the species of the *Anthonomus* subgenera *Anthonomorphus* and *Anthomorphus*, the genus *Pseudoanthonomus* and several species presently in *Anthonomus* but apparently closely allied to *Atractomerus nigrocalcaratus* Duponchel and Chevrolat, *A. dromedarius* Voss and *Omogonus gibbus* Chevrolat (see Clark and Burke 1985, 1986b,c; Clark 1987a,b,c, 1988, and in press). The distribution of apomorphic characters (presence indicated by a score of "1," absence by a score of "0") among the species of *Loncophorus* is depicted in Table 1.

The characters were analyzed using the PAUP computer programs (Swofford 1985) to determine the most parsimonious branching pattern for the species consistent with the distribution of characters determined to be apomorphic, thus minimizing the number of required hypotheses of homoplasy. The MULPARS, SWAP=GLOBAL and HOLD=10 options produced a single phylogenetic tree depicted in Fig. 53.

The following narrative is phrased in such a way as to denote absolute confidence, although it describes a series of ever tentative hypotheses. Explicit is the notion that the species named on the phylogenetic tree arose by splitting of hypothetical ancestral species represented by Roman numerals.

Ancestor I.—Adults of this species would have been recognized as *Loncophorus* by previous workers. They were relatively large and navicular in form. The larvae developed in the fruit of Bombacaceae. In addition, the adults had the following apomorphic characters:

- 1) Elytra with a large, somewhat flattened discal or middorsal area covered by dense, pallid scales and a declivital area with similar scales separated by slightly elevated sections with sparse vestiture (Figs. 1-16). (These areas are distinguishable but not well-developed in *L. costalimai* (Figs. 17, 18), less developed in *L. martinsi* (Figs. 19, 20) and lost altogether in *L. santarosae* and *L. myrmecodes* (Figs. 21-24).)
- 2) Mesotrochanters subtrapezoidal (Figs. 39, 40). (Included is the condition described below as character 21).)
- 3) Profemoral tooth slightly, irregularly serrate distal to deep to shallow anterior emargination (Figs. 37, 38). (The serrations are absent from *L. santarosae* and *L. myrmecodes*.)

Ancestor II.— Adults of this species were also relatively large and the larvae also developed in fruits of Bombacaceae. Adults had the following apomorphic characters:

- 4) Pygidium of female narrowed posteriorly (Fig. 43).
- 5) Oviposter elongate, coxites markedly sclerotized, with reduced styli.

Ancestor III.— Adults of this species had the following apomorphic characters:

- 6) Prosternum extended downward in front of procoxae.
- 7) Pygidium of female with apicomedian fovea (Figs. 43, 44). (The fovea was lost from *L. daviesii* and *L. longinasus*.)

Ancestor IV.— Adults of this species had the following apomorphic characters:

- 8) Rostrum with dense scales distal to antennal insertion.
- 9) Aedeagus constricted subapically, with rounded apical prominence (Figs. 25–27).

Ancestor V.— Adults of this species had the following apomorphic character:

- 10) Elytra with acute prominent humeri (Figs. 2, 4).

Ancestor VI.— Adults of this species had the following apomorphic characters:

- 11) Aedeagus bent downward in lateral view.
- 12) Aedeagus with apicolateral prominences (Fig. 28).

Ancestor VII.— Larvae of this species developed in flower buds rather than fruits of Bombacaceae. Adults had the following apomorphic characters:

- 13) Elytral interstria 5 with discal prominence. (This prominence became reduced to a small pustule in ancestor IX, transformed into an elongate, curved elevation in ancestor XII, then became obsolescent in *L. myrmecodes*.)

Ancestor VIII.— Adults of this species had the following apomorphic characters:

- 14) Frons sulcate.
- 15) Elytral interstria 4 with discal prominence.
- 16) Aedeagus constricted medially, subtruncate apically.

Ancestor IX.— Adults of this species resembled those of *L. fusiformis*, and like that species, had the following apomorphic characters:

- 17) Elytral interstria 5 with small discal pustule. (This is a modification of character 13 with the distribution attributed to it above.)

Ancestor X.— Adults of this species also resembled those of *L. fusiformis*. They had the following apomorphic character:

- 18) Pygidium of male with longitudinal dorsal carina.

Ancestor XI.— Adults of this species resembled *L. martinsi* in being somewhat less like those of ancestor I in character 1 than are adults of *L. costalimai*. They had the following apomorphic characters:

- 19) Elytral interstria 3 curved, with dense white scales (Figs. 19, 22, 24).
- 20) Pygidium of male with apicomedian emargination.
- 21) Mesotrochanters of male prominent (Fig. 40).
- 22) Metatibia of male constricted subapically (Fig. 40).

Ancestor XII.— Adults of this species had the pustule on elytral interstria 5 (character 17) modified to form a low, smooth, elongate elevation. Character 1 was even more obsolete than in ancestor XI. Like those of the descendant *L. santarosae* and *L. myrmecodes*, adults of ancestor XII bore little resemblance to those of ancestors I-IX but were like ancestor XI in possession of characters 19–22. In addition, adults of ancestor XII resembled *L. santarosae* in the following apomorphic characters:

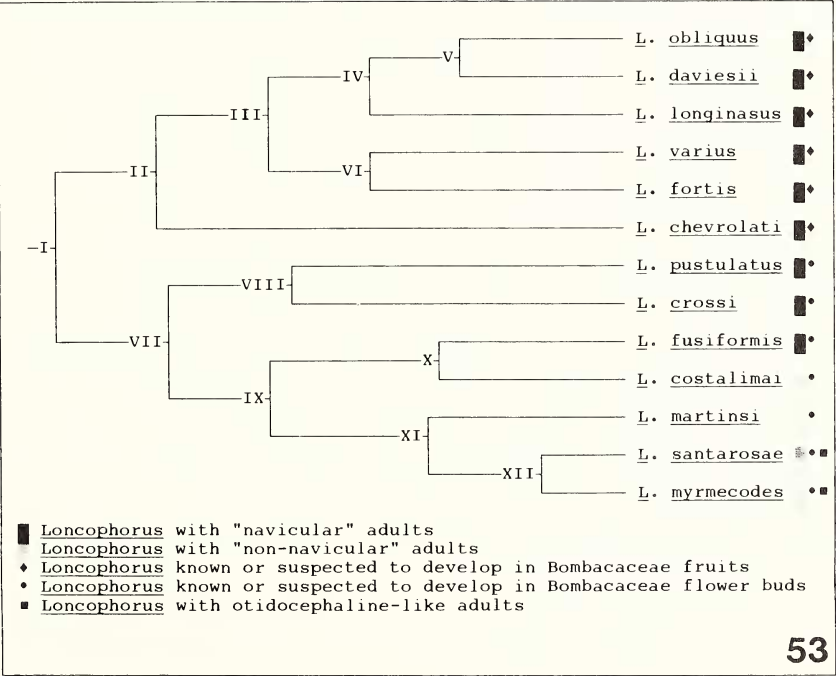
23) Elytra narrow at base, inflated posteriorly (Figs. 22, 24).

24) Pronotum and elytra relatively smooth, sparsely punctate, vestiture reduced in extent (Figs. 21-24).

Table 1. Data matrix for the reconstructed phylogeny of the species of *Loncophorus*, illustrated in Fig. 53

Taxa	Characters and Characters States
	000000000111111111122222
	123456789012345678901234
Outgroup	000000000000000000000000
<i>chevrolati</i>	111110000000000000000000
<i>costalimai</i>	1110000000000100011000000
<i>crossi</i>	1110000000000111100000000
<i>daviesii</i>	111111011100000000000000
<i>fortis</i>	111111100011000000000000
<i>fusiformis</i>	1110000000000100011000000
<i>longinasus</i>	111111011000000000000000
<i>martinsi</i>	1110000000000100010111100
<i>myrmecodes</i>	0100000000000100010111111
<i>obliquus</i>	111111111100000000000000
<i>pustulatus</i>	1110000000000111100000000
<i>santarosae</i>	0100000000000100010111111
<i>varius</i>	111111100011000000000000

Figure 53. Phylogenetic tree depicting the relationships among the species of *Loncophorus*



ACKNOWLEDGEMENTS

Thanks are extended to the individuals and institutions listed in the Materials and Methods Section for the loan of specimens. Many individuals provided generous assistance in locating specimens or literature or in the field. Thus, special appreciation is due C. Bodón, H.R. Burke, G. Kuschel, M.J. Lukefahr, R.P. Martins, E. Menezes, C.W. O'Brien, P.I. Persson, H.R. Pimenta, G. Rosado-Neto, R.T. Thompson, S. Vanin, D.R. Whitehead and G. Wibmer. Some specimens were collected by the author travelling with financial support from the "Biosystematics and Ecology of the Boll Weevil" research project, U.S. Department of Agriculture Broad Form Cooperative Agreement #12-14-7001-73 with Auburn University. H.R. Burke, J.D. Harper, M.C. Wooten and D.R. Whitehead reviewed various drafts of the manuscript. G. Wibmer helped with the writing of the Spanish abstract. This paper is published as Alabama Agricultural Experiment Station Journal Series No. 17-871318.

REFERENCES CITED

- Ahmad, M. and H.R. Burke. 1972. Larvae of the weevil tribe Anthonomini. Miscellaneous Publications of the Entomological Society of America 8: 31-80.
- Askwith, W.H. 1900. List of officers of the Royal regiment of Artillery from the year 1716 to the year 1899. 4th ed. William Clowes and Sons, Ltd., London and Beccles.
- Blackwelder, R.E. 1947. Checklist of the coleopterous insects of Mexico, Central America, the West Indies and South America, Part 5. Bulletin. United States National Museum, (185): I-IV, 765-925.
- Blanchard, C.E. 1845. Histoire naturelle des insectes, ... Volume 2, Didot, Paris. 524 pp.
- Bondar, G. 1937. Notas entomológicas de Bahia (I). Revista de Entomología 7(4): 475-483.
- Burke, H.R. 1964. Studies on the genus *Anthonomus* in North and Central America (Coleoptera: Curculionidae) II. The subgenus *Anthonomorphus* Dietz. The Coleopterists Bulletin 18(1): 7-17.
- Burke, H.R. 1968. Pupae of the weevil tribe Anthonomini (Coleoptera: Curculionidae). Texas Agricultural Experiment Station Technical Monograph 5, 92 pp.
- Burke, H.R. 1976. Bionomics of the anthonomine weevils. Annual Review of Entomology, 21: 283-303.
- Burke, H.R., W.E. Clark, and W.H. Cross. 1984. Larvae and pupae of the *Anthonomus* subgenus *Anthonomorphus* Dietz, *A. grandis* Boheman and *A.*

- hunteri* Burke and Cate (Coleoptera: Curculionidae). The Southwestern Entomologist 9(1): 84–90.
- Burke, H.R., W.E. Clark, J.R. Cate and P.A. Fryxell. 1986. Origin and dispersal of the boll weevil. Bulletin of the Entomological Society of America 32(4): 228–238.
- Champion, G.C. 1903. Biologia Centrali-Americana. Insecta. Coleoptera. Rhynchophora. Curculionidae. Curculioninae (part), Volume 4, part 4, pp. 145–312.
- Chevrolat [L.A.] A. 1832a. Monographie de deux genres nouveaux dans la famille des Curculionites. Annales de la Société Entomologique de France, 1: 210–220.
- Chevrolat [L.A.] A. 1832b. Monographie d'un genre nouveaux dans la famille des Curculionites. Annales de la Société Entomologique de France, 1: 442–443 [+ p. 448 (*errata et addenda*)].
- Clark, W.E. 1986. In Clark and Burke 1986a.
- Clark, W.E. 1987a. Revision of the *unipustulatus* group of the weevil genus *Anthonomus* Germar (Coleoptera: Curculionidae). The Coleopterists Bulletin 41(1): 73–88.
- Clark, W.E. 1987b. Revision of the Nearctic species of *Pseudanthonomus* Dietz (Coleoptera: Curculionidae). The Coleopterists Bulletin 41(3): 263–285.
- Clark, W.E. 1987c. Revision of the *Anthonomus* subgenus *Anthomorphus* Weise (Coleoptera: Curculionidae). *Quaestiones Entomologicae* 23: 317–364.
- Clark, W.E. 1988. The species of *Anthonomus* in the *albolineatus* group (Coleoptera: Curculionidae). Transactions of the American Entomological Society 113: 309–359.
- Clark, W.E. In press. Revision of the *furcatus* species group of the genus *Anthonomus* Germar (Coleoptera: Curculionidae). The Coleopterists Bulletin.
- Clark, W.E., and H.R. Burke. 1985. Revision of the *venustus* species and group of the weevil genus *Anthonomus* Germar (Coleoptera: Curculionidae). Transactions of the American Entomological Society 111: 103–170.
- Clark, W.E., and H.R. Burke. 1986a. A new neotropical species of *Anthonomus* (Coleoptera: Curculionidae) associated with *Bombacopsis quinata* (Bombacaceae). Proceedings of the Entomological Society of Washington 88(2): 320–327.
- Clark, W.E., and H.R. Burke. 1986b. Phylogeny of the species of *Anthonomus* subgenus *Anthomorphus* Dietz, with discussion of relationships with *Anthonomus grandis* Boheman (Coleoptera: Curculionidae). Journal of the Kansas Entomological Society 59(3): 508–516.
- Clark, W.E., and H.R. Burke. 1986c. Revision of the *gularis* species group of the genus *Anthonomus* Germar (Coleoptera: Curculionidae). The Coleopterists Bulletin 40(1): 1–26.
- Costa Lima, A. [M.] da. 1943. Gorgulhos do genero *Loncophorus* (Col. Curculionidae, Anthonominae). Boletim da Sociedade Brasileira de Agronomia 6(2):

119–122.

- Costa Lima, A. [M.] da. 1955. Sobre as especies de *Loncophorus* (Col., Curc., Anthonominae). *Neotrópica* 1(4): 50–54.
- Costa Lima, A. [M.] da. 1956. Insectos do Brasil 10° Tomo, Capítulo XXIX. Coleópteros. 4.^a e última parte. Escola Nacional de Agronomia, Série Didática No. 12. 373 pp.
- Costa Lima, A. da. 1968. Quarto catalogo dos insetos que vivem nas plantas do Brasil - seus parasitos e predadores, Parte 11, 1. Tomo, insectos, hospedeiros e inimigos naturais, pp. 1–622; Parte 11, 2. Tomo, bibliografia entomologica Brasileira, pp. 1–906; Parte 11, 3. Tomo, Indice de insetos e indice de plantas, pp. 1–265.
- Cronquist, A. 1981. An integrated system of classification of flowering plants. Columbia University Press, New York. xviii + 1262 pp.
- Dejean, P.F.M.A. 1835. Catalogue des Coléoptères ..., [2nd ed.]. Méquignon-Marvis & Sons, Paris. livr. 4, pp. 257–360.
- Dejean, P.F.M.A. 1837. Catalogue des Coléoptères ..., Troisième ed..., Méquignon-Marvis & Sons, Paris. livr. 5, pp. i-xiv, 1–503.
- Eschscholtz, J.F. 1825. Bericht über die Zoologische Ausbeute während einer Reise von Kronstadt bis St. Peter-Paul. *Isis* 6: 733–747.
- Fabricius, J.C. 1775. *Systema entomologiae*,... Korte; Flensburgi & Lipsiae. [30] + 832 pp.
- Fabricius, J.C. 1781. *Species insectorum*.... Bohn; Hamburgi & Kilonii. Volume 1, VIII + 552 pp.
- Fabricius, J.C. 1787. *Mantissa insectorum*.... Proft, Hafniae. Volume 1, XX + 348 pp.
- Fabricius, J.C. 1792. *Entomologica systematica*.... Proft, Hafniae. Volume 1, XX + 538 pp.
- Fabricius, J.C. 1801. *Systema eleutheratorum*.... Bibliopoli Academici Novi, Kiliae. Volume 2, 687 pp.
- Gemminger, M., and E. von Harold. 1871. *Catalogus Coleopterorum*..., Volume 8, Curculionidae, pp. 2181–2668. [+ 11 pp. (Index Generum, Addenda, Corrigenda).] Monachii.
- Germar, E.F. 1824. *Insectorum species novae*.... Hendel & Sons, Halae. Volume 1, Coleoptera, XXIV + 624 pp.
- Germar, E.F. 1836. (description of *Loncophorus petiminosus*, p. 395). In Schönherr, C.J. 1836.
- Gmelin, J.F. 1790. *Caroli a Linné Systema Naturae*.... Beer, Lipsiae. Edition 13, Volume 1, part. 4, pp. 1517–2224.
- Gomes, J. 1936. Novos hospedeiros e novas regioes de alguns insectos do Brasil. *O Campo*, Rio de Janeiro 7(82): 42–44.
- Gundlach, J. 1891. *Contribucion a la entomologia Cubana*, Tomo III, parte 5, Coleopteros. 404 pp. Habana.

- Gyllenhal, L. 1836. (description of *Loncophorus chevrolati*, pp. 393, 394). In Schönherr, C.J. 1836.
- Herbst, J.F.W. 1795. Natursystem aller bekannten in- und ausländischen Insekten,.... Pauli, Berlin. Käfer. VI. Theil, XXIV + 520 pp.
- Heyne, A. and O. Taschenberg. 1908. Die exotischen Käfer in Word und Bild. Schreiber; Esslingen & München. 27 Lief, VII + 262 + L. pp.
- Illiger, J.C.W. 1805. Zusätze, Berichtigungen und Bemerkungen zu Fabricii Systema Eleutheratorum Tomus II. Magazin für Insektenkunde 4: 69–174.
- Kuschel, G. 1955. Neuvas sinonimias y anotaciones sobre Curculionoidea (1) (Coleoptera). Revista Chilena de la Entomología 4: 261–312.
- Lacordaire, J.T. 1863. Histoire naturelle des insectes. Genera des Coléoptères.... Roret; Paris. Volume 6, pp. 1–608, 615–637.
- [de Laporte, F.L.N.] Le compte de Castelnau. 1840. Histoire naturelle des insectes Coléoptères. Volume 2, Duménil, Paris, 563 pp.
- Marshall, G.A.K. 1933. New Neotropical Curculionidae (Col.). Stylops 2(3): 56–69.
- Mendes, L.O.T. 1938. Relação dos insectos encontrados sobre plantas do estado de S. Paulo nos ano de 1936–1937. Revista de Agricultura, Piracicaba, 13(10–12): 482–490.
- O'Brien, C.W., and G.J. Wibmer. 1982. Annotated checklist of the weevils (Curculionidae *sensu lato*) of North America, Central America, and the West Indies (Coleoptera: Curculionoidea). Memoirs of the American Entomological Institute 34: i–ix, 1–382.
- O'Brien, C.W., and G.J. Wibmer. 1984. Annotated checklist of the weevils (Curculionidae *sensu lato*) of North America, Central America, and the West Indies (Coleoptera: Curculionoidea) - Supplement 1. The Southwestern Entomologist 9(3): 286–307.
- Olivier, [A.G.] 1789. Entomologie, ou histoire naturelle des insectes.... Panckoucke; Paris. Coléoptères, Volume 1 (genera paged separately).
- Olivier, [A.G.] 1790. Encyclopédie Méthodique. Histoire Naturelle. Insectes. Panckoucke; Paris. Volume 5, pp. 1–793.
- Olivier, A.G. 1807. Entomologie,.... Desray, Paris. Coléoptères, Volume 5, pp. 1–612.
- Olivier, A.G. 1808. Entomologie,.... Desray, Paris. Coléoptères, Volume 8, 171 pls.
- Panzer, G.W.F. 1798. Johann Euseb Voets Beschreibungen und Abbildungen hartschaalichter Insekten Coleoptera Linn. Palm; Erlangen. Volume 4, [xii] + 112 pp.
- Pierce, W.D. 1916. Studies of weevils (Rhynchophora) with descriptions of new genera and species. Proceedings of the United States National Museum, 51: 461–473.
- Platnick, N.I. 1979. Philosophy and the transformation of cladistics. Systematic Zoology 28(4): 537–546.
- Schenkling, S., and G.A.K. Marshall. 1934. Coleopterorum Catalogus, Pars 139,

- Curculionidae: Anthonominae, pp. 3–82; Laemosaccinae, pp. 1–8. (Volume 29).
- Schönherr, C.J. 1836. *Genera et species curculionidum* Roret, Paris; Fleischer, Lipsiae. Volume 3, pt. 1, pp. [I–II], 1–505; pt. 2, pp. 506–858.
- Schönherr, C.J. 1838. *Genera et species curculionidum* Roret, Paris; Fleischer, Lipsiae. Volume 4, pt. 2, pp. 601–1121 (+ 1122–1124, corrigenda).
- Schönherr, C.J. 1843. *Genera et species curculionidum* Roret, Paris; Fleischer, Lipsiae. Volume 7, pt. 1, pp. 1–479; pt. 2, pp. 1–461.
- Sleeper, E.L. 1958. Notes on the Anthonominae (Coleoptera, Curculionidae). *Ohio Journal of Science* 58(6): 366–370.
- Suffrian, E. 1871. Verzeichniss der von Dr. Gundlach auf der Insel Cuba gessammelten Rüsselkäfer. *Archiv für Naturgeschichte* 37(1): 121–184.
- Swederus, N.S. 1787. Et nytt Genus och Femtio nya Species af Insekter, beskrinfe. *Svenska Vetenskap Akademien Nya Handlingar* (2)8: 181–201.
- Swederus, N.S. 1788. *Svenska Vetenskap Akademien Nya Handlingar* (2)9: 203.
- Swofford, D.L. 1985. PAUP: Phylogenetic Analysis Using Parsimony, Version 2.4.1. Users Manual, Illinois Natural History Survey, Champaign, Illinois.
- Voet, J.E. 1806. *Catalogus systematicus coleopterorum*. Bakhuisen; La Haye. Volume 2, [1769]–1806(1806), pp. 1–82.
- Voss, E. 1944. Anthominen–Studien (Col., Curc.) (97 Beitrag zur Kenntnis der Curculioniden). *Stettiner Entomologische Zeitung* 105: 34–51.
- Whitehead, D.R. 1976. Classification and evolution of *Rhinochenus* Lucas (Coleoptera: Curculionidae: Cryptorhynchinae), and Quaternary Middle American Zoogeography. *Quaestiones Entomologicae* 12: 118–201.
- Wibmer, G.J., and C.W. O'Brien. 1986. Annotated checklist of the weevils (Curculionidae *sensu lato*) of South America (Coleoptera: Curculionoidea). *Memoirs of the American Entomological Institute* 39: i–xvi, 1–563 pp.
- Zimsen, E. 1964. The type material of I.C. Fabricius. Munksgaard, Copenhagen, 656 pp.

INDEX TO NAMES OF TAXA

(Synonyms in italics)

FAMILY GROUP TAXA

Anthonominae, 469, 472

Bombacaceae, 466, 472, 478, 482,
498, 508

Cryptorhynchinae, 481

Curculionidae, 469, 499

Malpighiaceae, 471

Malvaceae, 466

Otidoccephalinae, 469, 499

Pterygota, 469

Tetrapoda, 469

GENERA AND SUBGENERA

Anthonomorphus Dietz, 466, 469,
472Anthonomus Germar, 466,
471–472Atractomerus Duponchel and
Chevrolat, 471

Bombacopsis Pitt., 472, 487

Ceiba P. Mill., 472, 494

Chorisia Kunth., 472

Eriotheca Schott & Endl., 472, 497

Loncophorus Schönherr, 468

Loncophorus Chevrolat, 466,
468–469, 471–473, 495, 508

Myrmex, 499

Omogonus Chevrolat, 471

Pachira Aubl., 472

Pseudobombax, 490

Rhinolius Chevrolat, 471

SPECIES AND SUBSPECIES

aquadica Aubl., Pachira, 472, 486,
491

chevrolati Gyllenhal,

Loncophorus, 469, 472–474,

476, 487–489

costlimai, new species,

Loncophorus, 469–470, 473,
475, 494–496, 508–509crossi, new species, Loncophorus,
469–470, 473–474, 491–492

daviesi (Swederus),

Loncophorus, 479

daviesi (Swederus), Loncophorus,
479daviesii (Swederus), Loncophorus,
469–470, 473–474, 476,
479–481, 509daviesii Swederus, Curculio,
479–481dromedarius Voss, Atractomerus,
471, 508

ecuadorius (Marshall),

Loncophorus, 473, 476–479

ecuadorius Marshall,

Loncophorus, 476

endecaphyllum Vell., Bombax,
472, 489flavomaculatus Voet, Curculio,
473, 483, 485flumensis Costa Loma,
Loncophorus, 489

fluminensis Costa Lima,

Loncophorus, 473, 489

fortis (Champion), Loncophorus,
469–470, 473–474, 486

fusiformis (Champion),

Loncophorus, 466, 469–473,
475, 493–496, 509

gibbus Chevrolat, Omogonus, 508

grandis (Boheman), Anthonomus,
466, 472

humeralis Chevrolat,

Loncophorus, 473, 479, 481

- illinoensis , *Carya*, 478
 insignis Savigney, *Pachira*, 472,
 486–487
 longiflorum , *Pseudobombax*, 472,
 478, 491
 longinasus Costa Loma,
 Loncophorus, 469–470,
 473–474, 481–482, 509
 macrophylla Rose, *Bunchosia*, 471
marshalli Costa Lima,
 Loncophorus, 473, 476,
 478–479
 martinsi, new species,
 Loncophorus, 469–470,
 472–473, 475, 495–497,
 508–509
 myrmecodes, new species,
 Loncophorus, 469–470,
 472–473, 475, 498–499,
 508–510
 nigrocalcaratus Duponchel and
 Chevrolat, *Atractomerus*, 471,
 508
nigromaculatas Voet, *Curculio*,
 473, 483, 485–486
 nitidus (Champion), *Atractomerus*,
 471
 nitidus Champion, Loncophorus,
 471
 obliquus Chevrolat, Loncophorus,
 468–470, 472–474, 476–480,
 489
 parasita (Fabricius), *Rhychaenus*,
 484
parasita Fabricius, *Curculio*, 473,
 483–485
parasita Fabricius, Loncophorus,
 485
 pentandra (L.) Gaertn., *Ceiba*, 472,
 478, 491
petiminosus Germar, *Loncophorus*,
 473, 479–481
proboscideus Fabricius, *Curculio*,
 485–486
 pustulatus (Champion),
 Loncophorus, 469–470,
 472–474, 489–492
 quinata (Jacq.) Dugand,
 Bombacopsis, 466, 472, 498
 santarosae (Clark), Loncophorus,
 469–470, 472–473, 475,
 497–499, 508, 510
 santarosae Clark, *Anthonomus*,
 466, 497
 sessilis (Benth.) Pitt.,
 Bombacopsis, 472
 speciosa A. St-Hil., *Chorisia*, 472,
 478
 stigma (Linnaeus), *Rhinochenus*,
 481
 stigma (Linnaeus), *Rhychaenus*,
 481
 stigma Linnaeus, *Curculio*, 481
 stigma Olivier, *Rhychaenus*, 473,
 479, 481
thoracicus Panzer, *Curculio*, 473,
 485
varians Gmelin, *Curculio*, 483
 varius (Fabricius), Loncophorus,
 469–470, 472–474, 482–484,
 486
 varius (Fabricius), *Rhychaenus*,
 483
 varius Fabricius, *Curculio*,
 483–485
 verruciger (Champion),
 Atractomerus, 471
 verruciger Champion,
 Loncophorus, 471